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ASSISTED BY
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Chapter I

INFECTIOUS DISEASE

IN this chapter we will deal with one of the subjects which, year by year, is calling for greater attention on the part of the medical practitioners, the Ministry of Health, and all engaged in work of public health.

This important subject calls for not a little risk on the part of the health official, but happily the statistics do not show an undue morbid return in consequence of the daily risks run by those concerned.

As sanitarians, it is not necessary for us to understand all the symptoms or manifestations of the various diseases, although, after a little experience, one gets to recognise them very easily, even in their early stages.

What we are concerned with, however, are the important points of—means of infection; means of prevention; period of incubation and invasion; convalescence; quarantine; isolation and proper means of disinfection.

It is now an accepted fact that all infectious diseases are associated with micro-organisms or minute living germs. These micro-organisms or bacteria are possessed of independent existence, and have the power of multiplying at an enormous rate under suitable conditions.

In order to assist the student as far as possible to understand some of the terms in connection with infectious disease, we will discuss here the most important of these.

First, then, we have what is known as an **Epidemic**, which applies to an outbreak attacking many persons, and prevailing generally, and which may be an infectious or contagious disease attacking many persons at the same time, but of a temporary character.

Next we have an **Endemic**, or a disease peculiar to a district

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or to a certain class of people ; it may be a prevalent disease arising from local causes, such as bad water or air.

When we speak of **Pandemic**, we mean disease incidental to a whole people, and spreading from country to country.

By **infection** is meant disease caused by other than actual contact, and is the means by which poisonous matter or exhalations produce disease in a healthy body, and may be said as being that which taints or corrupts, as by communication from one to another.

Contagion, as the name implies, is the means whereby disease is contracted by actual contact or touch.

Again, we have **Inoculation**, whereby disease is communicated by inserting infectious matter into the punctured skin or the flesh, and the introduction of foreign matter into the blood circulation by incision of the epidermis.

The **Period of Invasion** means the period preceding infection, or when the person is subjected to the conditions of risk.

By the **Period of Incubation** we mean the time which elapses from the time of infection to the commencement of the fever itself.

Sometimes we have a period of **Latency**, where the infection is of such a kind, or is under such conditions, as to be delayed in its development, and during which time the disease does not show itself.

Now, let us look at the various diseases as set down by law as of an infectious nature. Under the Infectious Disease (Notification) Act, 1889, Section 6, we have the following definition :—

“ In this Act the expression ‘infectious disease,’ to which this Act applies, means any of the following diseases, namely, smallpox, cholera, diphtheria, membranous croup, erysipelas, the disease known as scarlatina or scarlet fever, and the fevers known by any of the following names, typhus, typhoid, enteric, relapsing, continued, or puerperal, and includes as respects any particular district, any infectious disease to which this Act has been applied by the local authority of the district in manner provided by this Act.”

To the foregoing list one finds that in many cases local authorities have added measles, whooping-cough, chickenpox, plague, cerebro-spinal fever, acute anterior poliomyelitis, while lately we have had other additions which include tuberculosis (all forms), ophthalmia neonatorum, malaria, dysentery, trench fever, acute primary pneumonia, and acute influenzal pneumonia.

The student, however, will do well to make a point of memorising the first group only of the above, as these are the ones with which examination questions mostly deal.

Here let us deal briefly with how infection may be conveyed by those diseases mentioned in the first group.

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Thus, in smallpox, the breath and discharges from the body are means by which this disease may be transmitted through air and food from one person to another.

With cholera, infection comes mostly from the bowel discharges, and in this way anything with which they are brought into contact. For this reason it is very important that all stools from an infected patient should be disinfected before being disposed of, otherwise the disease will readily be transmitted to others.

With diphtheria, the breath and discharges from mouth and nose are very infectious, and consequently anything they come in contact with, such as food, air, and clothing, may become contaminated. The same conditions apply to membranous croup. In erysipelas, the infection is conveyed into the body through a wound or an abrasion of the body coming in contact with any substance containing the germs.

Scarlet fever infection may be from the breath or throat and nose discharges, and again during the period of desquamation, i.e. the period when the skin peels off the patient's body.

Exhalations from the body and the breath are the means by which typhus fever germs are carried, while the source of infection in typhoid and enteric fever is from the bowel discharges, as these contain the whole infection.

With relapsing or continued fevers one cannot say with any degree of certainty what the source of infection is.

In Section 3 of the Infectious Disease (Notification) Act, 1889, the duty of reporting a case of infectious disease to the Medical Officer of Health for the district devolves upon the head of the family to which the patient belongs, or the nearest relative, or those having charge of the patient, while every medical practitioner attending, or called to visit a case of infectious disease, must forthwith notify the same, stating the name of the patient, the situation of the building, and the nature of the disease, to the Medical Officer of Health of the district. Failure to carry out these provisions may result in a penalty being inflicted.

As to what conduces to infectious disease, many things may be attributable, such as, for instance, bad air, badly ventilated rooms, filthy houses, bad surroundings, food-stuffs, milk, domestic animals, such as cats, vermin, and, among other things, very often the house, its aspect or the site on which it is built, and faulty sanitary arrangements.

Cleanliness, along with plenty of fresh air and sunlight, are the best preventatives of infectious disease, and by the rigid enforcement of these specifics, much can be done to aid in preventing the ravages of this type of disease.

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Before passing on to the action taken by an inspector with respect to infectious disease, it will be of interest to the student, as well as a valuable help in tracing any cases, to study the appended list, which gives the length of the periods of invasion and infectivity in most cases. It must, however, be borne in mind that these times vary considerably, and the figures given are only average times.

	Periods of	
	Invasion.	Infection.
Smallpox	14 days	6 weeks
Diphtheria	7 "	6 "
Enteric fever	21 "	6 "
Typhus fever	14 "	4 "
Cholera	3 "	3 "
Scarlet fever	7 "	6 "
Erysipelas	3 "	2 "
Measles	14 "	4 "
Whooping cough	21 "	6 "
Influenza	5 "	3 "
Chickenpox	18 "	3 "
Mumps	21 "	3 "

As we have seen earlier in this chapter, the duty of notifying a case of infectious disease rests with the parent, guardian, or person in charge of the patient, and with the medical practitioner in attendance.

The information having been sent to the Medical Officer of Health for the district, that official notifies the sanitary inspector, who straightway calls at the house where the patient is, and proceeds to take all particulars regarding the case. For this purpose the inspector is usually provided with a notebook for entries similar to that shown on page 5, and in addition he may have an official form to fill in with particulars regarding the case. This form is, when completed, sent to the Ministry of Health. Forms of this nature are issued for smallpox, typhoid and enteric fever, influenza, pneumonia, etc.

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INFECTIOUS DISEASE.

Disease,.....
Reported by Dr...... *Date*,.....
Name of Patient,..... *Age*,..... *Occupation*,.....
Residence,.....
Parent or Guardian's Name..... *Occupation*,.....
Number of Apartments,..... *No. of Inmates*,..... *Adults*,.... *Children*,....
Name of Proprietor or Factor,.....
Probable cause of Infection,.....
Date of Removal to Hospital,.....
School attended by Patient or other members of household,.....
.....
.....
Milk Supply,.....
Date of Disinfection,.....
General Remarks as to condition of House, Sanitary Accommodation, etc.,.....
.....
.....
.....

Having completed his inquiries in the house, the next thing the inspector must see to, is what is to be done in the way of preventing the spread of the disease.

In working-class houses and in poor localities, there is usually little enough accommodation for the inmates of the houses under normal conditions, and when infectious disease breaks out in such houses it will readily be understood that no adequate provision can be made for isolation of the patient, and that being the case, not only are the chances for the patient's complete recovery lessened, but all coming in contact, and more especially those living in the same house, are running a very grave risk indeed.

For this reason, local authorities have, at considerable expense, erected isolation hospitals for the isolation and proper treatment of infectious disease.

Usually those hospitals are reserved for the treatment of fevers, diphtheria, and in some cases for tuberculosis and measles. But one rarely finds part of the hospital used for cholera or small-pox ; a separate building is usually acquired for these, so as to minimise the risks run of a serious outbreak.

The inspector then, having made his inquiries, at once arranges for the removal of the patient to the hospital when it is neither possible nor desirable to treat the patient at home.

In cases of better-class homes, where the patient can be isolated and have proper attention, the inspector will satisfy himself that

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such steps for isolation are satisfactory. The room in which the patient is to be nursed must be devoid of any carpets or rugs and have as little furniture in it as possible.

The windows should be open top and bottom in order to give plenty of fresh air and ventilation. A fire should at all times be kept burning in the room, while an isolation sheet should be hung over the door. This sheet may consist of an old cover or piece of sheeting soaked in some liquid disinfectant, and always kept moist, and should cover the whole of the aperture of the door, and even extend some way beyond it. A receptacle (small bath or similar object) should be placed outside the door of the room, containing water and liquid disinfectant, and into this should be placed any dishes used by the patient. All stools from the patient should be disinfected before being discharged into the drains, and it is always advisable to use old rags to receive the discharge from the throat and nose, these rags being burned when used.

So much, then, for the isolation of the patient ; and now we come to where in the house the isolation rooms should be. In a word, they should be at the top of the house or in a wing of the house which can be shut off for the time being.

It must not, however, be supposed that the proceedings just described cover the whole of the different types of infectious disease. These precautions are all right for most of the diseases, but there are one or two where a great deal more trouble is involved, such as in smallpox, cholera, plague, and sometimes typhus fever. Fortunately, the occurrence of plague and cholera cases are few and far between, but we do have occasional outbreaks of smallpox, and frequently with typhus fever. Smallpox was at one time very prevalent and fatal in this country, but the compulsory vaccination measure, which prevailed for some years, seems to have done some good in reducing not only the mortality of this disease, but also the number of cases and outbreaks.

Vaccination has been the cause of much controversy, but statistics go to show that since its introduction, the country has practically been rid of the scourge of this disease. Certainly, we have had one or two outbreaks, but not even the worst of these of recent years rivals the poorest outbreak of past times. On the notification of a case of smallpox, the inspector with all speed sets about making careful inquiries. In addition to the list already given, he takes particulars of the patient's movements for a period preceding the notification, and long enough to cover the period of incubation. He also inquires into the various places the patient may have visited, and takes a note of all persons and their addresses who have been in contact. The inspector will also ascertain if the patient has been vaccinated, and at what time.

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All those living in the house with the patient are, where accommodation has been secured by the local authority, removed to what is known as a contact house—that is, a house which has been acquired for the purpose, and in which “contacts” are kept during the incubation period of the disease. While there, they need not necessarily be confined, but may go out and in, and in some cases attend their work.

The main object of these houses is that the Medical Officer of Health may keep a watchful eye on the “contacts,” and immediately any symptoms or signs of illness are shown, the “contacts” can be dealt with, whereas, if they were not under rigid supervision, the likelihood is that they would endeavour to hide any signs of disease until it had got a good hold. While the inmates of the infected house are put up at the contact house, their own home is properly and thoroughly disinfected in the manner described in the next chapter.

Having got those in direct contact with the patient removed to the contact house, where they are offered revaccination, the inspector now turns his attention to the other contacts outside the home of the patient. These he must visit, take particulars with respect to their age, occupation, employers, etc., offer them vaccination or revaccination, as the case may be ; and the inspector must visit them every alternate day for fourteen days, and see them personally, so that he may satisfy himself that they are free from sickness. In this way a check is kept on all contacts during the period of incubation, and should any other case occur, it is quickly handled ; hence, what might otherwise have resulted in a serious outbreak is checked and stamped out.

With cholera, plague, and in some districts, typhus fever, the same precautions are taken, all with the exception of the vaccination, which, of course, only applies to smallpox.

Typhus fever is invariably found in the poorest districts of large towns, and is usually associated with insanitary conditions and overcrowding.

Should an outbreak occur in a better-class neighbourhood, the infection can usually be traced to contact with an infected person.

In dealing with a case of typhoid or enteric fever, the inspector will make a point of inquiring into the drainage and water supply of the house in which the case occurred, and also any possible contamination or putrefaction of food used by the patient. In dealing with the water supply, he should note if storage cisterns are used, or if the source of supply is from a shallow well. The drains should be tested by means of the smoke test in order to prove their soundness or otherwise.

With diphtheria, careful inspection must be made of the

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drains, sanitary arrangements, conveniences, and connections. The smoke test is also applied to the drainage system in this case.

Here let us digress a little, to point out how essential it is that all ventilation shafts from drains and soil pipes should be carried to a height clear of all openings to the house. If this was not the case, the student would see that in the event of an infected stool being emptied into the closet or drain—and if the stool has not been disinfected—how easy it would be for the liberated germs to pass into the building and so spread the infection. This is a very important point, as in mild cases it very often happens that even the inmates of the house do not realise, until some little time has elapsed, that there is infectious disease among them. It is no unusual thing for a doctor to be called in, when the parents become alarmed, to find that the child is “skinning,” and then to be told that the child is just recovering from scarlet fever. Very often our worst cases are those which come from infection or contact from slight cases.

Another means to prevent the spread of infection is by keeping the children of an infected house—from which a patient has been removed to hospital—at home for a period covering the time of incubation of the disease from which the patient is suffering.

In this connection, the inspector or Medical Officer of Health grants a certificate to the Education Authorities similar to that appended, and this is followed by another when the children have completed the time allowed.

No.....

PUBLIC HEALTH DEPARTMENT,

.....192..

To.....

.....

.....

.....

I beg to inform you that.....

residing with.....

at No.....

.....at present suffering from an Infectious Disease, viz. :—.....

and that.....

who resided therein.....attending your School.

Yours truly,

.....

Medical Officer of Health.

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In the course of the chapter, we have referred to isolation hospitals, and it will be as well here to state briefly how these should be arranged.

An infectious disease hospital should, for preference, be on the outskirts of the town, and in arranging for its construction, the size may be computed by allowing one bed for every 1000 of the inhabitants.

In laying out the hospital, provision should be made for a porter's lodge, waiting and inquiry rooms, at the main entrance, while at the rear entrance, buildings should be provided for coachman's house, stable, and carriage-house for the accommodation of the ambulance. Recreation grounds should be provided, and so arranged that the patients suffering from one disease do not mix with those suffering from another. Each disease should have its own separate block or blocks, absolutely disconnected, and at least forty feet apart ; and no block should be nearer to the boundary wall than forty feet.

The boundary wall should be of stone or brick, at least eight feet high.

The wards should, for preference, be of single-storey pattern, although where space is a consideration, they may be of two storeys, and the roof may be constructed flat and used for the exercise of patients.

As to floor space, 140 to 200 square feet of area for each patient should be allowed, and from 2500 to 3000 cubic feet of space allowed for each bed.

There should be not less than 12 feet of wall space, while the Local Government Board recommend 1 square foot of window area to each 70 cubic feet of ward space.

The windows should be as close to the ceiling as practical, and should be opposite each other and so arranged that the bed is between two windows.

Wards should be amply ventilated, and as plentiful a supply of fresh air admitted as circumstances will allow.

The typhus fever ward should occupy a position remote from any other ward.

All windows of wards ought to be double-sash windows and made to open inwards at the top.

Ventilation, lighting, and sanitary arrangements must have special attention.

The sketch, Fig. 1, will give the student an idea of the ground plan of a small fever block for eight patients.

The hospital must be provided with a regular disinfecting station, and a mortuary, situated in as private a place as possible, together with post-mortem rooms, must be erected.

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Laundry accommodation must also be provided, as also storage rooms, kitchen, etc., while a building to house the nursing staff, servants, etc., is also essential.

In connection with the sanitary conveniences in the wards, it is necessary to point out that these should be cut off from the wards by means of a ventilation space.

Now it must be thoroughly understood that smallpox hospitals must be isolated from all other buildings. Indeed, the Local Government Board recommend that such hospitals should not be erected on a site within a quarter of a mile of any other hospital, workhouse, asylum, or similar establishment, of a population of

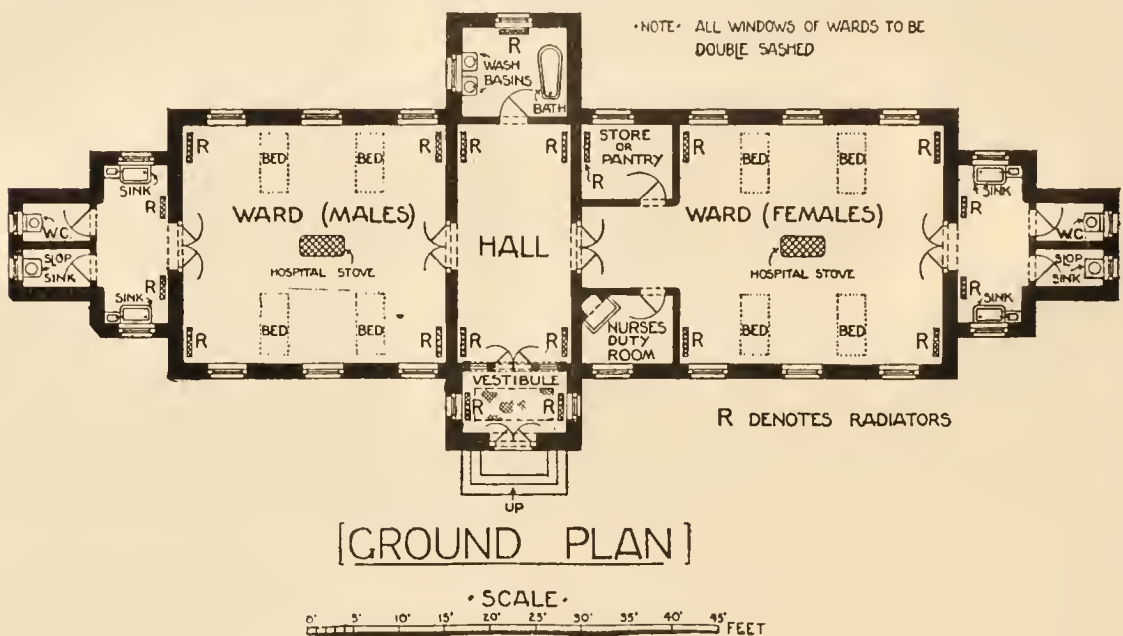


Fig. 1

as many as 200 persons, or within half a mile of a centre having a population of 600 persons, whether in an institution or dwelling-houses.

The construction and arrangements for smallpox hospitals are, of course, similar to those just described for fever hospitals.

At the beginning of this chapter, it was stated that it was not necessary for sanitarians to understand all the symptoms of infectious disease, but as questions sometimes crop up at examinations, it may be well if we give here just a brief summary of some of those diseases, together with their probable causes, so that the student may the better grasp any question which may crop up.

Smallpox.—This disease, which is very much dreaded everywhere, has since the introduction of vaccination lost a good deal of its terrors. The incubation period may be said to run from twelve to fourteen days, if the disease is contracted by infection. Two

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days after the attack the rash makes its appearance, usually around the wrists, ankles, and on the face of the patient. This disease is highly infectious from the onset, usually by the breath, and is at its worst when the pustular stage has been passed and the scabs begin to break and separate. The duration of infection may range from three weeks, in mild cases, to six or seven weeks in more severe cases. Patients may be infected by inhaling the germs, or food may be the vehicle carrying the germs. It is also asserted by some authorities that the virus of smallpox may be carried long distances by the air. All discharges from the patient ought to be burned or disinfected.

When the pustular stage of the disease has been passed and the scabs begin to separate and break, they should be smeared with olive oil or vaseline, as in this way not only will the application tend to allay the irritation to the patient, but there will be less likelihood of particles floating in the atmosphere and scattering infection.

Cholera.—This disease, which is very prevalent in India, is happily seldom met with in Great Britain, although during the period 1831 to 1866 four serious outbreaks of it occurred in this country. The period of incubation is usually about three days. This disease resembles enteric fever a good deal, especially in the manner in which it may be spread. The discharges from the bowels are highly infective, and the organisms find entrance to the patient *via* water and food.

Insanitary conditions play a large part in the propagation of the disease, and for this reason the ventilation, cleanliness, and sanitary arrangements of a district where an outbreak occurs require special attention, while the water supply and food should also be investigated. All discharges from the patients should be burned or thoroughly disinfected.

The period of infection is said to run about three weeks with this disease.

Enteric or Typhoid Fever.—The incubation period of this fever is usually about twenty-one days, while the period during which there is danger of infection may be set down at six weeks or longer.

This disease does not seem to be contracted by the air, the medium by which the virus gains admission being by food or water. The discharges from the bowels and the urine are the seat of the danger of infection, and these must be thoroughly disinfected before being disposed of. Where a case occurs, strict attention must be directed to the source of water supply and food ; also the situation of the house and its sanitary arrangements call for immediate attention.

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It is well known that in some congested parts of old towns the houses may be damp, the air spaces congested, and the sanitary arrangements primitive. All these may have gone on for a long period of years, but let only one case occur in such a neighbourhood, and the difficulty of stamping out an outbreak will be a big one.

Those in attendance on typhoid patients must see that their hands are thoroughly washed and disinfected before handling any food or water for drinking purposes. The milk supply should also be inquired into.

Diphtheria.—A peculiarity of this disease is that epidemics of it usually commence in September and reach their height about October or November, and then fall away again during the following months, while from May to July we find the least number of fatal cases as a rule. The incubation period is from three to seven days, although, in some severe cases, the disease seems to develop much more rapidly than even the minimum period given above. The period of infection lasts from four to six weeks, according to the severity of the case. Danger of infection lies in the discharges from the nose and mouth, and possibly from the breath. Old rags should be used for the discharges, and these should be immediately burned after use.

Where a case occurs, the drainage and sanitary arrangements should be tested and thoroughly inspected. Domestic animals, notably cats, are also said to be carriers of this disease.

Scarlet Fever—sometimes called *Scarlatina*—has an incubation period of about seven days, and is highly infectious from the onset. The infection is given off by the breath, by discharges from the throat, and by the fine particles or scales of the skin during the skinning or desquamation period. This latter stage is just when the patient is convalescent, and therein a grave danger lies. In the case of persons treated at home, it is no uncommon thing to find that during the skinning period they are taken out in carriages or even public conveyances, and so the disease is spread. Again, a fairly common source of infection is found in milk carriers; possibly some boy or girl carrying milk may be suffering from a very mild attack of the fever, and so the disease is spread. Dairymen should also be advised of the case of scarlet fever among their customers—not with a view of stopping the milk supply, but so that he may see to it that no milk-can or vessel is left at the infected house, as under such circumstances there is always a possibility of infection being conveyed by means of the milk-can. In this case, as in the case of diphtheria, old rags should be used for the throat and nose discharges of the patients, and the rags immediately burned after use. In dealing with a case, attention should be given to surroundings and milk supplies.

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Typhus Fever.—As already stated, this disease is usually the outcome of filthy surroundings and insanitary conditions. It walks hand in hand with dirt, poverty, and distress, and can easily be prevented by cleanliness and good ventilation.

The period of incubation in this case is about fourteen days, and the period of infection about four weeks. Infection is given off by the breath, by exhalations from the body, and possibly by the excreta. Disease may be had by contact with an infected person. One important point is that, although contagion is undoubtedly very virulent, the virulence is soon dispersed in the open air. In such cases, one must see to the cleansing of the houses affected, and to the thorough ventilation of the rooms. In addition, thorough disinfection of all rooms, bedding, and articles therein, must take place.

Erysipelas.—This is a disease belonging to the infectious class, although in this case the virus enters the blood stream by means of cuts, abrasions, or wounds coming in contact with some infected surface. The incubation period is usually about three days, and the period of infection from two to three weeks.

Puerperal Fever.—A disease peculiar to women in a lying-in state. It used to be supposed to originate from the patient having been in contact with some person suffering from scarlet fever, but latterly there is good reason for believing that the disease really arises from dirt and insanitary conditions.

Measles.—The incubation period in this disease is usually about fourteen days, and the duration of infection about four weeks. It is highly infectious from the onset, and unfortunately parents are prone to take a light view of these cases, and children are often needlessly exposed while still suffering from the disease, and thereby not only run grave risks themselves, but spread the infection broadcast. This disease is most prevalent among children.

German Measles.—This disease somewhat resembles the last-named in its characteristic rash, but is not so infectious, and is rarely fatal.

Whooping-Cough.—The incubation period here is from fourteen to twenty-one days, and for six weeks is highly infectious. It attacks infants more fatally than older children and adults, although all ages are liable to contract it. The mode of infection seems to be purely aerial, and the country seems to suffer from periodic epidemics of the disease.

It is quite a common practice for children in a highly infectious state to be taken about in public conveyances, or allowed to run about the streets, thereby spreading infection broadcast.

Mumps.—This disease is non-fatal, but is highly infectious, and the contagion is carried by the breath of infected persons.

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The incubation period is about twenty-one days, and the disease lasts about three weeks.

Chicken-pox.—Here we have a disease which attacks persons of all ages, but it is most prevalent among young children. The incubation period is about eighteen days, and the period of infection three weeks. The illness is rarely of a serious nature, and without complications, rarely fatal. The infection may be said to be mainly aerial.

Tuberculosis—commonly known as consumption or phthisis when affecting the lungs—is due to a variety of causes, chief among which are bad housing and ventilation, overwork, dampness of soil on which house is built, overcrowding, nature of occupation, bad feeding, from certain milk supplies, i.e. from cows suffering from tubercular trouble, while filthy conditions and insanitary surroundings all tend to propagate the disease. It would be difficult to state the duration of the period of incubation, but it is admitted that infection is present throughout the whole period of the malady. This disease, which has been properly termed the “white scourge” of our country, is responsible for something like 80,000 deaths per annum in Great Britain, or **11** out of every **100**.

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Chapter II

METHODS OF DISINFECTION

HAVING made the necessary inquiries into a case of infectious disease, and the patient having been removed to hospital, or, if confined at home, when the period of infection is past, the inspector carries through a thorough disinfection of all premises, clothing, bedding, etc., which have been in contact with the patient.

There is a good deal of misunderstanding as to what a real disinfectant really is, and, unfortunately, many products are on the market to-day for which high disinfectant powers are claimed, these not being of any very great value for the purpose.

Many of these are merely **deodorants**, and simply kill any offensive odours there may be about a house.

Others again are simply possessed of **antiseptic** properties, and while they have the power of arresting the growth and development of germs, fall short of what is required as a disinfectant.

A **disinfectant** must fulfil the following very essential conditions, if it is to be of any value :—

Firstly, it must be capable of killing germs and their spores ; killing the germs is a comparatively simple matter, but killing the spores is often a serious problem. Secondly, the disinfectant must be applied to every part in sufficient strength. And thirdly, it must be applied for a period long enough to do its work.

In connection with this latter requirement, it will be readily understood that some things present less difficulty to this operation than others. Mattresses, quilts, or any thick article require some time before the full power of the disinfectant reaches the centre of them.

Among germicides, we have five so-called natural methods of dealing with infected articles, namely, fire, hot air, boiling water, steam, and sunlight.

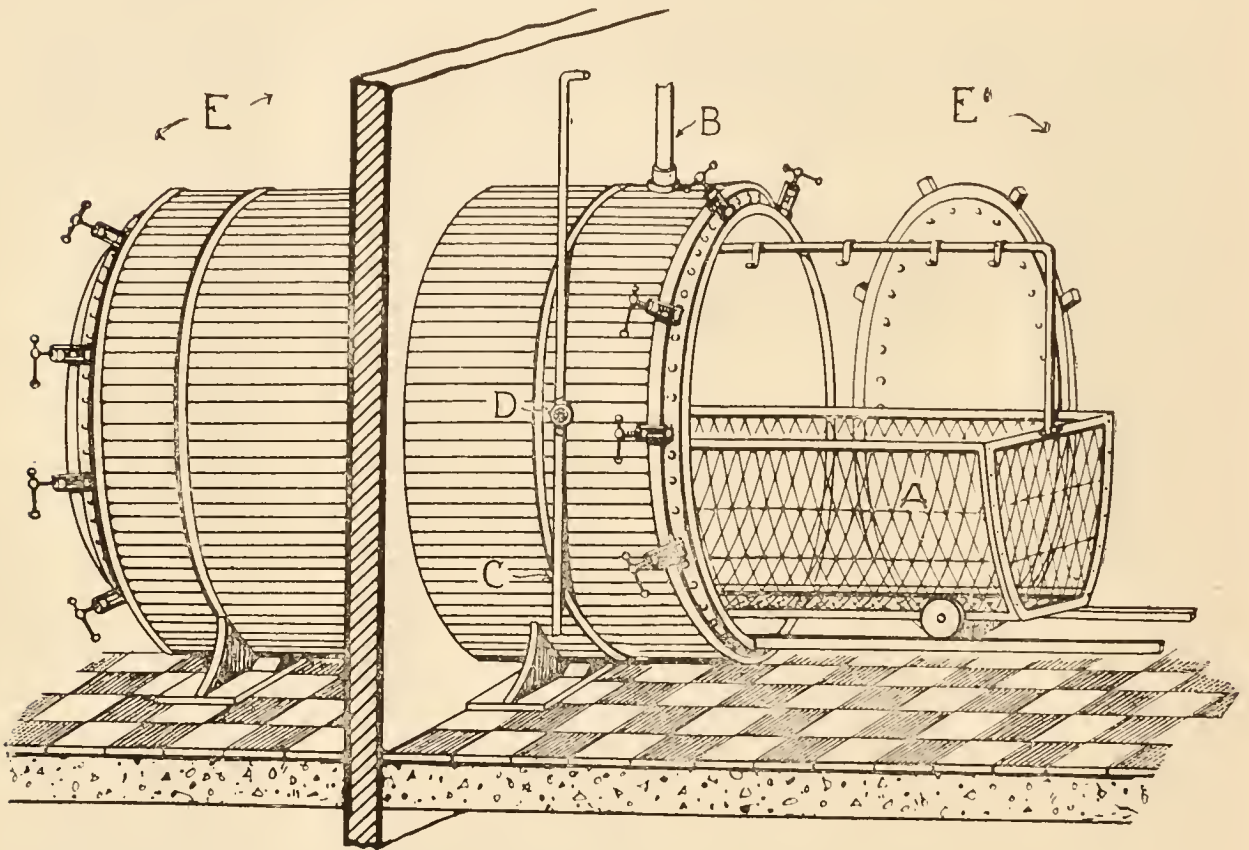
Fire, of course, is rather a drastic method of destroying germs, as in destroying the bacilli, the article itself has also to be destroyed.

Hot air is the method adopted with regard to disinfecting books, eiderdowns, etc., which would be destroyed by any other method. While dry heat is not so efficacious as moist heat, still, when articles such as those already mentioned have to be treated, this method gives good results if the temperature is raised to about 212 degrees F., and maintained at that for a few hours.

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The boiling-water process (i.e. the action of boiling infected articles) is a very good method, as neither germs nor spores can withstand the temperature of boiling water for any length of time.

Steam is one of our best disinfectants. Remembering that one has to disinfect bulky articles such as pillows, mattresses, blankets, etc., where the organisms have penetrated into the



A - BASKET OR CAGE

B - STEAM PIPE

C - STEAM PIPE WITH VALVE

D - VALVE

E - ROOM FOR DISINFECTED CLOTHES

E' - ROOM FOR INFECTED CLOTHES

Fig. 2

articles, steam under pressure has proved, after many careful experiments, to give splendid results.

We will now deal with the application of steam for this purpose, and the necessary apparatus.

Figs. 2 and 3 will serve to show, firstly, how the apparatus is fitted, and, secondly, the different parts of the machine.

This type of disinfector is fixed in the disinfecting station erected in connection with an infectious disease hospital as a rule. It consists of an oval chamber, or in some cases a round chamber,

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which has a door with clamp screw fittings at either end. The apparatus itself is built in two rooms, a partition dividing the machine in two, so that infected articles are put in at one end and taken out at the other, and so kept from being again infected. The interior of the chamber is fitted with rails, on which a basket or cage runs, and in which the articles to be disinfected are placed, and over this basket or cage we have a frame with hooks on which articles may be suspended.

The chamber is surrounded for the most part with a steam jacket (see Fig. 3). A saddle boiler is fitted over the fire, and circulating pipes convey the steam to a steam drum fixed above the disinfecting chamber. A pipe conveys the steam from the top of the steam drum to the disinfecting chamber itself, and a screen is provided to diffuse the steam as it enters the chamber. An automatic pressure regulator is fitted on the pipe leading from the steam drum to the chamber, while an exit pipe is carried from the bottom of the water jacket of the central chamber. In large installations, steam is generated in large boilers and conducted to the disinfecting chamber. The articles having been placed in the cage or basket, the latter is now pushed into the chamber, and the doors clamped and secured; the steam is then applied.

Now, the time required for exposure will depend largely on the nature of the articles being disinfected.

At the expiry of the time allowed, the door at the other end of the chamber is opened and the articles taken out, or if preferred, the steam may be shut off, and the heat in the apparatus allowed to dry the articles therein, which, of course, are wet owing to the

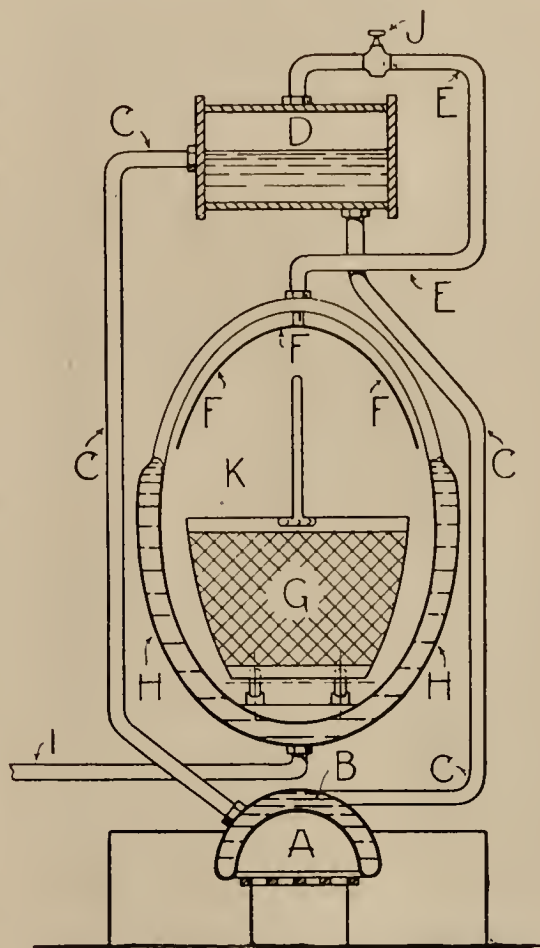


Fig. 3

INDEX.

- A. Furnace.
- B. Saddle Boiler.
- C. Circulation Pipes.
- D. Steam Drum.
- E. Pipe conveying Steam to Chamber.
- F. Plate for Spreading Steam.
- G. Cage or Basket on Wheels.
- H. Steam Jacket.
- I. Exit Pipe.
- J. Steam Regulator.
- K. Chamber.

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action of the steam. There are many types of steam disinfectors, such as the Washington Lyon, the Geneste and Herscher "Equifix" apparatus, Reek's steam disinfecter, Threshe's disinfecter, etc.

In connection with steam used for disinfecting purposes, it is interesting to note that one may use superheated steam, saturated steam, confined steam, and current steam.

In order that the student may better understand these expressions, it will not be out of place here to give a brief definition of them:—

Superheated Steam is steam the temperature of which is higher than that which corresponds to the pressure under which it is formed.

Saturated Steam is steam the temperature of which corresponds to the pressure under which it is formed.

Confined Steam is steam boxed up in a chamber, the inlet and outlet of which are closed up after the chamber has been filled with steam and all air expelled.

Current Steam is a stream of steam, or where there is a constant circulation of steam going on.

As a disinfectant, current steam has a much greater penetrating power than confined steam, its value being equal to 893.7 units of steam in every pound of water converted into steam.

Superheated steam penetrates more rapidly, and disinfects more quickly than steam at atmospheric or lower pressures. Twenty minutes' application of this form of steam at a high pressure will disinfect articles more effectively than steam at a low pressure would do in one hour.

With regard to pressure in disinfectors, low pressure is said to be up to 25 pounds to the square inch, and above that is recognised as high pressure.

Let us now turn our attention to disinfection by hot air for the treatment of articles such as good books, furs, etc., which do not lend themselves to steam treatment.

The difficulty here lies in the fact that if the temperature of the air be raised above a certain point the articles will be scorched and destroyed, and again, hot air being less potent than steam or moist air, the operation takes longer.

Of the different types of hot-air apparatus on the market, one of the best is that known by the name of Ransom's hot-air apparatus. The machine consists of a metal chamber surrounded by wood and felt; those latter, being non-conductors, economise the heat. The method of generating the heat is by a gas ring or circular burner, the heat passing up a shaft into the chamber, while a flue is carried from the top of the apparatus. In both flues, a thermometer is fixed to show the temperature of the air passing into

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the chamber, as well as that passing out. A valuable addition to the apparatus is a mercurial regulator fixed in the inlet flue. This regulator controls the amount of gas consumed, and consequently the amount of heat generated. Finally, the machine is fitted with a device, as a precaution against fire, by an arrangement in the outlet flue which consists of a fusible link of metal, and this link melts or fuses should the temperature reach a certain height (300 degrees F.), and by this means a damper is closed, and the gas shut off.

Types of both steam and hot-air disinfectors are made in portable patterns, so that they may be taken from place to place, and these are eminently satisfactory.

What are known as *chemical germicides*, for disinfecting purposes, contain one or more of the following :—

Perchloride of mercury—strength,	1	part in	100
Carbolic acid	„	1	„ 20
Cresylic acid	„	1	„ 20
Permanganate of potash	„	1	„ 20

With regard to these, the time of exposure required (with the exception of the first-named) is twenty-four hours, while it is calculated that perchloride of mercury only requires an exposure of ten minutes.

The trouble with chemicals for disinfecting, however, lies in the fact that, to be of any value for the purpose, they must be applied in destructive or poisonous quantities, and a very apparent danger would necessarily result ; while, if the chemical is not used in effective quantities, it is then little short of useless.

One frequently comes across saucers in sickrooms containing one or other of the above-mentioned solutions with a large percentage of water in them ; or, again, it is no uncommon thing to find a weak solution of these in a water-closet basin or sink, and under these circumstances more harm than good is resulting, as the inmates of the room or house, ignorant of the properties of the chemical, and using only a few drops in a large quantity of water, lull themselves and others into a false sense of security as to the virtues of the article they are using.

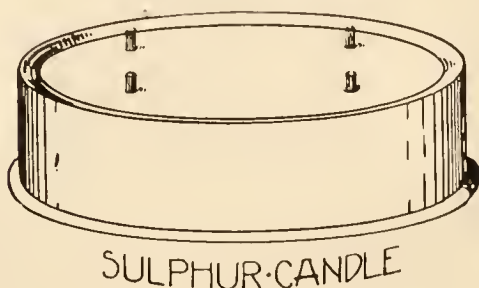
Chemical germicides can give good results, but the manner in which they must be employed to do so is a barrier to their successful use.

These chemicals are, of course, advocated for the purpose of room disinfection. Let us therefore take a few of the methods of disinfection of rooms, furniture, and articles not removed for steam or hot-air treatment, which have been and are being used at present for this purpose.

The commonest form of room disinfection throughout the

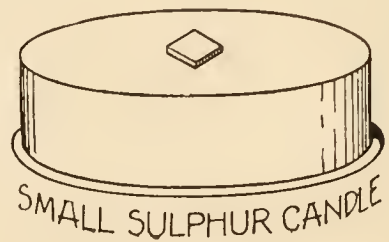
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country at one time was the **fumigation** method by **sulphurous acid**. By demonstrations, it has been proved that fumigation by this method—if the sulphurous acid be present to the extent of one per cent of the space—will kill the germs of most diseases, but it will not kill the spores of many of them. Again, with fumigation, the slightest covering will protect the germs, as no matter what the reagent is that is used, it will not penetrate either garments or crevices in walls.



SULPHUR CANDLE

Fig. 4



SMALL SULPHUR CANDLE

Fig. 5

Originally, the method of generating sulphurous acid was by burning *rock or lump sulphur*, broken into small fragments, in an old iron vessel ; in practice, one very often used an iron shovel, if one was available. Some red-hot cinders were placed on the shovel, and the sulphur placed on top, a pail containing some water was placed in the centre of the floor of the room, the kitchen tongs—opened out—were placed across the pail, and the shovel with the hot ashes and sulphur was placed on top.

Later, lump or rock sulphur was superseded by sulphur in a form more easily handled, and in this form known as **Sulphur Candles**, two types of which are shown in Figs. 4 and 5. These consist of metal tins into which the sulphur is poured when hot, and wicks are put in to facilitate their burning properly. When used, the wicks are lit, and the candle is then set in a vessel (a kitchen basin will do), containing a little water. The only difference in the two candles shown is that the one is smaller than the other ; the small one being sufficiently large for fumigating a closet or very small room. The quantity of sulphur required to give one per cent of sulphurous acid in a room to be fumigated is *one pound per thousand cubic feet* of space, but it is often as well to increase this amount to (say) one and a half pounds of sulphur.

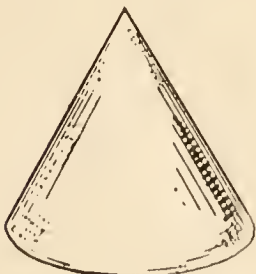


Fig. 6.

Sulphur Cones, as shown in Fig. 6, are another form of fumigation, but these have given place to the “candles” also.

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The next method of fumigation is by **Sulphume** (CO_2). This consists of sulphur dioxide (gas) condensed into a liquid by pressure, and contained in a metal cylinder which is fitted at the top with a sealed nozzle of soft lead as shown in Fig. 7. It is claimed for Sulphume that as a germicide it is equal in its effect to double its weight of sulphur burnt for fumigation purposes. The method of applying this chemical is as follows.

The operator takes the cylinder in his left hand, with the soft lead nozzle pointing away from him, and with a sharp stroke of a strong knife he severs the lead nozzle, and the gas immediately escapes. He then places the cylinder, with the nozzle pointing in an inclined fashion downwards, in a wooden or earthenware vessel on the floor. It is important that the cylinder be inverted, otherwise the whole of the gas will not escape. When liberated from the cylinder, the liquid, in resuming the gaseous stage, becomes intensely cold, and correspondingly heavy, with the result that at first the gas floats with great density about the floor, furniture, and lower parts of the room, and rapidly forms sulphurous acid gas, by mixing with the air of the room. As the gas gradually becomes warmed, it ascends through the air of the room to the ceiling. The time taken to disin-



Fig. 7

fect a room with sulphur, sulphur cones, or candles, should be twenty-four hours; with Sulphume, however, it is claimed that the operation can be done in from six to ten hours. Here we have a great drawback to these methods of fumigation in practice, because the poorer class houses cannot afford to have a room closed for so long a period. As a result, there are two alternatives: either to close the room for a shorter period, and therefore reduce the effectiveness of the fumigant; or provide accommodation for the people during the period of disinfection. As the latter is rather a big task, the former is usually found in operation in practice.

The next method of fumigation we will now consider, is by means of *Formaquettes*, as shown in Fig. 8. These consist of chemical tablets, in which there is a large percentage of permanganate

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of potash. They are very powerful in operation, and being convenient in size, are easily carried about. To fumigate a room by this method, it is only necessary to place one of these tablets in a tin or bowl, and pour over it four ounces formaldehyde (40 per cent).

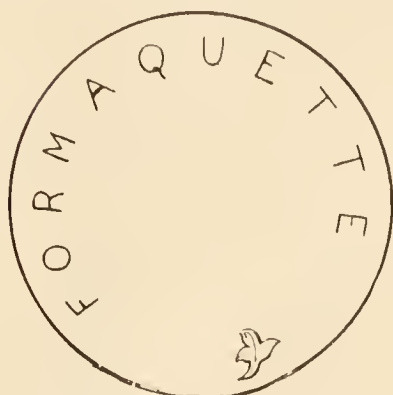


Fig. 8

This quantity is sufficient to act as a germicide for a room up to 1500 cubic feet capacity.

Next, we have what is known as **Vaplamps**, as shown in Fig. 9, and which consist of two parts: *A* being a perforated cylinder with a candle-wick at the bottom, and *B* a metal container which fits on top of the part *A*. This container holds a certain quantity of chemical powder. A metal cap is fitted

to the top of the container. To set the lamp in action, the operator removes the cap on top of the container and lights the candle-wick at the bottom of the container *B*. It is claimed for this lamp that it is capable of fumigating from 1000 to 1200 cubic feet of space in from eight to ten hours.

Formic Aldehyde Vapour is highly recommended for this work. This method of fumigation is carried out by evaporating tablets of "paraform" over an "Alformant A" lamp, a process similar to that already described with the Vaplamp. In the later type of lamp for this purpose, a special lamp is used with methylated spirits as the heating medium and placed under a boiler containing water for generating steam. In the centre of this boiler is a container holding a 40 per cent formic aldehyde solution.

On the water in the boiler being heated, the steam passes to the central chamber containing the formic aldehyde, and forces it through the nozzles at the top of the lamp into the room. While it cannot be said that "formalin" in a gaseous state is as effective as in its liquid state, still this method of fumigation is in many respects superior to the sulphur methods.

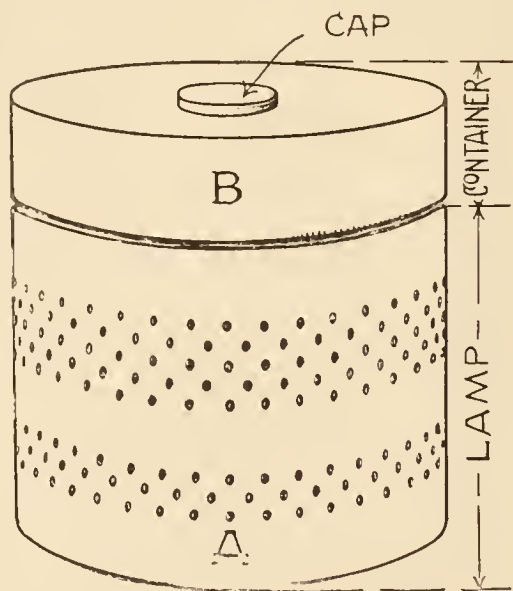


Fig. 9

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Chlorine Gas is sometimes used as a fumigant, and consists of a combination of strong hydrochloric acid to chloride of lime in the proportion of from one and a half to two pints of the acid to every pound of the lime for every 1000 cubic feet of space to be treated. Earthenware vessels are best for this purpose, metal ones not being suitable. The lime should be put in the basins first, and the acid added last. As the gas given off is very poisonous, the operator should see that he can leave the room immediately he has mixed the two ingredients. The room in this case must remain closed for at least twelve hours.

Let us now turn our attention to the **method of preparing a room** for the fumigating operation. The windows must be closed, and all openings around them and the fireplaces ; ventilation openings, etc., should then be sealed by pasting brown paper over the joints and openings. Next, the articles in the room should be so arranged that the gas will have full play around them. Wardrobe, cupboard, and other doors should be left open. Any clothing not removed to be steamed should be hung loosely over chairs, bedstead ends, or on rails.

Having set the fumigant free, the operator then leaves the room, closes the door, and pastes paper all around the door openings, not forgetting the keyhole. Special gummed paper may be had for fumigation purposes, which prevents the operator having to carry or prepare paste on the premises. The operator should make a point of noting that every precaution is taken to prevent fire when burning reagents are used, and it is here that CO_2 , or Sulphure, and Formaquettes, have a distinct advantage. On the expiry of the time allowed for fumigating the room, the operator will make his way inside, and open the windows to their full extent. He will also remove the paper from the grate and ventilators, and so drive the fumes from the room as quickly as possible. As to the after-treatment of the room, it is well that, if the walls have been papered, they should be stripped and repapered ; if size-coloured, they should be “ redone up,” and if oil-painted, they should be thoroughly washed down with soap and water.

It is at this stage of the work that the mechanical effect of soap and water can do so much in the way of a disinfecting agent ; thus, all floors and all furniture that will stand it should get a liberal treatment with the water and soap. A little liquid disinfectant added to the water will also help in this direction.

As we have seen, fumigation—apart from falling short in many respects as a thorough disinfectant—has also the disadvantage of taking too long in the process ; hence we are now using sprayers in most cases of disinfecting. Disinfection under this method consists of spraying the walls, floors, and contents of a

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room with a 40 per cent solution of formic aldehyde by means of a machine known as a sprayer, a type of which is shown in Fig. 10. The machine roughly consists of a tank of strong copper, fitted with a handle and leather knapsack straps. By means of these straps the sprayer may be carried on the operator's back. On the top of the machine, which is dome-shaped, is set a pressure gauge, which indicates the pressure of the air and liquid inside the tank. The tank is of very stout make, and is riveted around the body. A copper delivery pipe is led from the centre of the tank bottom to the pipe, and there fitted with a screw-down valve or stop-cock. A copper delivery pipe is led from the centre of the tank bottom to the pipe, and there fitted with a screw-down valve or stop-cock

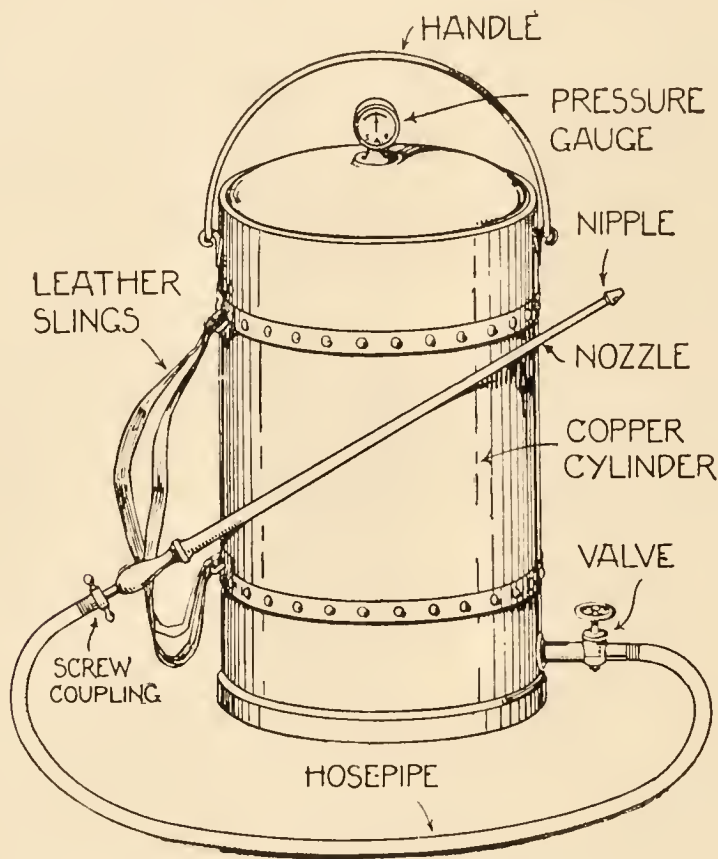


Fig. 10

to the outside of which is attached a piece of flexible hose piping. At the other end of this piping a screw coupling is fixed, into which fits a long copper nozzle with wooden handle. The nipple of this nozzle is made of copper, with an inner screw-threaded button or stud having two oblique grooves cut in it. The strength of the spray is regulated by the distance this button is screwed into position.

To charge the apparatus, we put the formic aldehyde into a pail to the extent of 40 per cent of the quantity we require, and then add 60 per cent of clean water. Having stirred the solution

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up, we now take a foot-pump, which is fitted with a suction pipe of hose piping sufficiently long to reach the bottom of the pail, and we place this pipe in the solution. Next we take the long copper nozzle off the machine at its junction with the hose piping, and we connect the coupling of the latter with the coupling on the side of the foot-pump. The indicator on the machine will now read zero or naught. We now open the valve or stop-cock on the machine, and by long steady strokes of the pump handle, we charge the machine, finishing up by taking the piping of the pump from the pail, and pumping in air for a few strokes. The indicator will now read somewhere about the maximum pressure if the machine is fully charged.

Having charged the machine, we again fix the nozzle on the place provided for it, and proceed to spray the room and contents. Immediately the valve is opened, the formic aldehyde under pressure will issue from the point of the nozzle in the form of a fine spray. We commence with the walls, but do not start at the top, but at the bottom of these, and work upwards ; in this way, damage is not done to expensive wall papers by little rivers of the disinfectant running down over a dry surface. We then go all round the walls and ceiling, and afterwards spray the articles in the room, although care must be taken not to touch highly polished furniture or pianos, otherwise the result will be disastrous. We, of course, finish by spraying the floor. With the sprayer, this powerful disinfectant is driven into corners and crevices, and any openings or apertures there may be in the floors, ceiling, or walls of the room, while the formic aldehyde itself (being very powerful) will penetrate into everything in the room. Another big advantage this method has, is in the fact that the room need only be closed for a few hours, while there is no great necessity for the papering of all the openings in connection with windows, or the stuffing of chimney flues ; and, above all, there is the satisfaction that we are using a true disinfectant which fulfils all requirements.

This method of disinfecting is now becoming universal, and is of great service in connection with the disinfection of halls, schools, and houses, and also on board ship.

Where special measures are necessary for disinfecting, a good method is to first use the formic aldehyde spray, and then to follow that up with fumigation by sulphur, sulphume, or chlorine gas, when good results should be obtained.

On board ship, one sometimes finds that provision has been made for disinfecting purposes by installing a steam disinfector, and also a mechanical system whereby the whole ship, or any part of it, may be fumigated when required.

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Chapter III

LAW RELATING TO INFECTIOUS DISEASES

IN the **Public Health Act, 1875**, *Section 46*, we have the first reference to infectious disease. There it is laid down that, on the certificate of the Medical Officer of Health, or any two medical practitioners, any house or part thereof, being in such a filthy or unwholesome condition that the health of any person is affected or endangered thereby, or that the whitewashing, cleansing, or purifying of such house would tend to prevent or check infectious disease, the Local Authority shall give notice in writing to the owner or occupier of such house to whitewash, cleanse, or purify the same. Should the terms of such notice not be complied with, such person shall be liable to a daily penalty of ten shillings, and the local authority may themselves do the work required and recover the expenses in a summary manner.

In *Section 120*, the Local Authority may, if they are of the opinion, after receiving a certificate from the Medical Officer of Health, or a medical practitioner, that the cleansing and disinfecting of any house, or part thereof, or of any articles therein likely to retain infection, would tend to check or prevent infectious disease, they shall give notice in writing to the owner or occupier of such house requiring him to cleanse and disinfect such house and articles within a time specified, and failing his complying with the notice, he shall be liable to a penalty not exceeding ten shillings during each day offence is continued, or they may do the work themselves and recover the expenses in a summary manner. In the case of persons who, from poverty or other cause, are unable to carry out the requirements of this section, the Local Authority may do such work without enforcing the requirements, provided the owner or occupier gives his consent.

Section 121 gives the Local Authority powers to direct the destruction of any bedding, clothing, or other articles which have been exposed to infection, for which they may pay compensation to the owners.

Any Local Authority may, under *Section 122*, provide a proper place with all necessary apparatus and attendance for disinfecting bedding, clothing, or other articles which have become infected, and may disinfect articles free of charge.

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They may also provide and maintain a suitable carriage or carriages for the conveyance of infected persons to hospital under *Section 123*.

We now come to a very important section under this Act, so we will therefore take it verbatim :—

“ *Section 124*.—Where any suitable hospital or place for the reception of the sick is provided within the district of a local authority, or within a convenient distance of such district, any person who is suffering from any dangerous infectious disorder, and is without proper lodging or accommodation, or lodged in a room occupied by more than one family, or is on board any ship or vessel, may, on a certificate signed by a legally qualified medical practitioner, and with the consent of the superintending body of such hospital or place, be removed, by order of any justice, to such hospital or place, at the cost of the local authority ; and any person so suffering, who is lodged in any common lodging-house, may, with the like consent and on a like certificate, be so removed by order of the local authority.”

“ An order under this section may be addressed to such constable or officer of the local authority as the justice or local authority making the same may think expedient ; and any person who wilfully disobeys or obstructs the execution of such order shall be liable to a penalty not exceeding ten pounds.”

The great difficulty in connection with the foregoing section is the question as to what really constitutes “ proper lodging or accommodation,” as very often the medical practitioner in attendance is unwilling to certify that such is the case, even when proper provision for isolation cannot be made.

With respect to the removal of infected persons from any ship or boat to a hospital, and for keeping such persons there as long as may be necessary, the Local Authority may, under *Section 125*, make regulations thereanent. Such regulations, however, must be approved by the Local Government Board, and these regulations may impose penalties on offenders against the same.

Under *Section 126*, any person who—

- “ (1) While suffering from any dangerous infectious disorder, wilfully exposes himself without proper precautions against spreading the said disorder in any street, public place, shop, inn, or public conveyance, or enters any public conveyance without previously notifying to the owner, conductor, or driver thereof that he is so suffering ; or,
- “ (2) Being in charge of any person so suffering, so exposes such sufferer ; or
- “ (3) Gives, lends, sells, transmits, or exposes, without previ-

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ous disinfection, any bedding, clothing, rags, or other things which have been exposed to infection from any such disorder,

shall be liable to a penalty not exceeding five pounds ; and a person who, while suffering from any such disorder, enters any public conveyance without previously notifying the owner or driver that he is so suffering, shall, in addition, be ordered by the court to pay such owner and driver the amount of any loss and expense they may incur in carrying into effect the provisions of this Act with respect to disinfection of the conveyance."

"Provided that no proceedings under this section shall be taken against persons transmitting with proper precautions any bedding, clothing, rags, or other things for the purpose of having the same disinfected."

When it has been brought to the knowledge of any owner or driver of a public conveyance that an infected person has been conveyed therein, he shall immediately provide for the disinfection of such conveyance (*Section 127*). Failure on the part of the owner or driver to comply with the terms of this section renders him liable to a penalty, and should he be required to convey an infected person, he may charge a sufficient sum to cover any loss or expense incurred by him.

Under *Section 128*, it is a punishable offence for any person to let for hire any house, room, or part of a house in which any person has been suffering from any dangerous infectious disorder, without having such room, house, or part of a house and all articles therein liable to retain infection, disinfected to the satisfaction of the legally qualified medical practitioner granting the certificate in connection with the case. For the purposes of this section, the keeper of an inn shall be deemed to let for hire part of a house to any person admitted as a guest into such inn.

It is also a punishable offence if anyone letting for hire, or showing for that purpose, any house or part of a house, on being questioned by any person negotiating for the hire of such house or part of such house, as to the fact of there having been therein any person suffering from dangerous infectious disease within six weeks previous to that date, knowingly makes a false answer to such question (*Section 129*).

The penalty in this case may, at the discretion of the court, be a penalty not exceeding twenty pounds, or imprisonment, with or without hard labour, for a period not exceeding one month.

By *Section 120*, the Local Government Board may make regulations with respect to the treatment of persons affected with cholera or any other epidemic, endemic, or infectious disease, and for preventing the spread of cholera and such other diseases, as

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well as on the seas, rivers, and waters of the United Kingdom and the high seas within three miles of the coasts thereof.

Power for Local Authorities to provide hospitals is given in *Section 131* as follows :—

“ Any local authority may provide for the use of the inhabitants of their district hospitals, or temporary places for the reception of the sick, and for that purpose may

“ Themselves build such hospitals or places of reception ; or

“ Contract for the use of any such hospital or part of a hospital or place of reception ; or

“ Enter into any agreement with any person having the management of any hospital, for the reception of the sick inhabitants of their district, on payment of such annual or other sum as may be agreed upon.”

“ Two or more local authorities may combine in providing a common hospital.”

For the prevention of epidemic disease, we have the following important provisions :—

“ *Section 134*.—Whenever any part of England appears to be threatened with, or is affected by any formidable epidemic, endemic, or infectious disease, the Local Government Board may make, and from time to time alter and revoke, regulations for all or any of the following purposes, namely :—

“ (1) For the speedy interment of the dead ; and

“ (2) For house-to-house visitation ; and

“ (3) For the provision of medical aid and accommodation for the promotion of cleansing, ventilation, and disinfection, and for guarding against the spread of disease ;

and may by order declare all or any of the regulations so made to be in force within the whole or any part or parts of the district of the local authority, and to apply to any vessel on inland waters, or on arms or parts of the sea, for the period in such order mentioned.”

Section 137 gives power of entry to the Local Authority and their officers on any premises or vessel for the purpose of executing or superintending the execution of any regulations as issued by the Local Government Board.

Section 141 gives Local Authorities power, whether Rural or Urban, to provide a mortuary and make by-laws for its use, as well as to provide for the decent and economical interment of any body received therein.

The next section is worth quoting in full, viz. :—

“ *Section 142*.—Where the body of one who has died of any infectious disease is retained in a room in which persons live or

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sleep, or any dead body which is in such a state as to endanger the health of the inmates of the same house or room, is retained in such house or room, any justice may, on a certificate signed by a legally qualified medical practitioner, order the body to be removed, at the cost of the local authority, to any mortuary provided by such authority, and direct the same to be buried within a time to be limited in such order ; and unless the friends or relations of the deceased undertake to bury the body within the time so limited, and do bury the same, it shall be the duty of the relieving officer to bury such body at the expense of the poor rate, but any expense so incurred may be recovered by the relieving officer in a summary manner from any person legally liable to pay the expense of such burial."

"Any person obstructing the execution of an order made by a justice under this section, shall be liable to a penalty not exceeding five pounds."

N.B.—It is interesting to note that no definition of infectious disease is given in the Public Health Act ; the term employed therein being "any dangerous infectious disease."

We will now turn our attention to the Infectious Disease (Notification) Acts, 1889 and 1899.

In *Section 6* of the Act of 1889, we have the definition of infectious disease as given in Chapter I. of this volume.

The Act of 1889 was adoptive, i.e. before becoming operative, it had to be adopted by the urban, rural, or port sanitary authority wishing to avail themselves of its provisions. The Infectious Disease (Notification) Extension Act, 1899, made the Act of 1889 compulsory.

Dealing, then, with the Infectious Disease (Notification) Act, 1889, the following is a digest of the principal sections :—

Section 3 fixes the responsibility as to the notification of any case of infectious disease. This, as we have seen in Chapter I., falls on the medical practitioner in attendance on the patient, and also on the head of the family or those having charge of the patient.

Section 4 deals with the type of forms to be used by, and the fee to be paid to, medical practitioners for the notification of cases.

Under *Section 7*, power is given to the Local Authority to cause the provisions of this Act, with reference to any infectious disease not included in the list given in *Section 6*, to extend such list, and such order may be permanent or temporary. Such extension requires the authority of the Local Government Board.

By *Section 13*, the provisions of the Act shall apply to every ship, vessel, boat, tent, van, shed, or similar structure used for human habitation, in a similar manner as if it were a building.

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The Local Government Board to fix the areas with regard to any ship, vessel, or boat lying in river, harbour, or other water.

Section 15 states that “ nothing in this Act shall extend to any building, ship, vessel, boat, tent, van, shed, or similar structure belonging to Her Majesty the Queen, or to any inmate thereof.”

In *Section 16* we have the following definition among others :—
“ The expression occupier includes a person having the charge, management, or control of a building, or of the part of a building in which the patient is, and in the case of a house the whole of which is let out in separate tenements, or in the case of a lodging-house, the whole of which is let to lodgers, the person receiving the rent payable by the tenants or lodgers, either as his own account or as the agent of another person, and in the case of a ship, vessel, or boat, the master or other person in charge thereof.”

In *Section 17* we have the application of the Act to Scotland, and its application to Ireland in *Section 18*.

The whole of the foregoing Act of 1889 is now a compulsory measure by the passing of the Infectious Disease (Notification) Extension Act, 1899, and the provisions of the Act of 1889 are now operative in every urban, rural, and port sanitary district.

We now come to the Infectious Disease (Prevention) Act, 1890, which extends to every London district after the expiration of four months from the passing of the Act, and to every urban and rural sanitary district after the adoption thereof.

Under *Section 4* of this Act, provision is made, where the Medical Officer of Health is in possession of evidence that any person in his district is suffering from infectious disease attributable to milk supplied from a dairy within or without the district, or that such milk is likely to cause infectious disease, such Medical Officer shall, if authorised by an order from a justice, have power to inspect such dairy, and, if accompanied by a veterinary surgeon, to inspect the animals therein, and if on inspection he is satisfied that infectious disease may be caused by the milk from such dairy, he shall report thereon to the Local Authority, such report to be accompanied by a report submitted to him by the veterinary surgeon, and the Local Authority may thereupon give notice to the dairyman to appear before them within a time not less than twenty-four hours, to show cause why an order should not be made prohibiting him from selling milk within the district until such time as the order is withdrawn, and failing his showing such cause, the Local Authority shall make such order, and shall give notice of the facts to the Sanitary Authority and County Council (if any) of the district in which the dairy is situate. The order shall be immediately withdrawn when the Medical Officer, on behalf of the Local Authority, is satisfied that the milk has been changed, or the cause

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of infection removed. No dairyman shall be liable for a breach of contract if the breach be due to an order as described.

It is a punishable offence to obstruct the Medical Officer or Veterinary Surgeon in the execution of his duty under this section, and also should the dairyman not comply with the terms of the order when passed.

Section 5, in cases where this Act has been adopted, repeals *Section 120* of the Public Health Act, 1875, and reads as follows :—

“(1) Where the medical officer of health of any local authority or any other registered medical practitioner certifies that the cleansing and disinfecting of any house, or part thereof, and of any articles therein likely to retain infection, would tend to prevent or check infectious disease, the clerk to the local authority shall give notice in writing to the owner or occupier of such house, or part thereof, that the same and any such articles therein will be cleansed and disinfected by the local authority at the cost of such owner or occupier, unless he informs the local authority within twenty-four hours from the receipt of the notice, that he will cleanse and disinfect the house, or part thereof, and any such articles therein, to the satisfaction of the medical officer of health within a time fixed in the notice.

“(2) If within twenty-four hours from the receipt of the notice, the person to whom the notice is given does not inform the local authority as aforesaid, or if, having so informed the local authority, he fails to have the house, or part thereof, or any articles disinfected as aforesaid, within the time fixed in the notice, the house, or part thereof, and articles shall be cleansed and disinfected by the officers of the local authority under the superintendence of the medical officer of health, and the expenses incurred may be recovered from the owner or occupier in a summary manner.

“(3) Provided that where the owner or occupier of any such house, or part thereof, is unable, in the opinion of the local authority, or of their medical officer of health, effectually to cleanse and disinfect such house or part thereof, and any article therein likely to retain infection, the same may, without any such notice being given as aforesaid, but with the consent of such owner or occupier, be cleansed and disinfected by the officers of, and at the cost of, the local authority.”

Section 6 deals with the handing over of bedding, etc., for the purpose of disinfection, and fixes a penalty for refusal to do so.

Section 7 imposes a penalty on anyone ceasing to occupy a house in which, within six weeks previously, there has been a case of infectious disease, who, on being questioned as to such being the case, makes a false statement.

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The body of a person who has died of an infectious disease must not be retained longer than forty-eight hours in a mortuary or room, not used as a dwelling-place, sleeping-place, or workroom, unless with sanction in writing of the medical officer or medical practitioner. (Vide *Section 5*.)

By *Section 9*, any person who dies of infectious disease in hospital, and the medical officer or medical practitioner certifies that it is desirable that the body shall not be removed except for burial, then such body shall only be removed for that purpose; while in the case of bodies being retained longer than forty-eight hours in a room used as a dwelling-, sleeping-, or work-room without the sanction of the medical officer, a justice may grant an order for the removal of the body for burial (*Section 10*).

Section 11 deals with the disinfection of public conveyances used for carrying dead bodies of infected persons.

Infected persons without proper lodging may, under *Section 12*, be detained in hospital—until free of infection—by an order of a justice.

Section 13 is a very important one, and states :—

“ Any person who shall knowingly cast, or cause or permit to be cast, into any ashpit, ashtub, or other receptacle for the deposit of refuse matter, any infectious rubbish, without previous disinfection, he shall be guilty of an offence under this Act.”

Where *Sections 7* and *13* are in force in any district, notice of them must be given to the occupier of any house in which a case of infectious disease occurs. (Vide *Section 14*.)

Section 15 deals with the provision of shelter for the accommodation of families who have had to leave their homes owing to a case of infectious disease therein. By *Section 22*, this Act shall not apply to Scotland.

Before leaving this Act, let us note one or two definitions as laid down in *Section 2* of the Act.

“ ‘ Dairy ’ shall include any farm, farmhouse, cowshed, milk store, milk shop, or other place from which milk is supplied, or in which milk is kept for the purposes of sale.”

“ ‘ Dairyman ’ shall include any cowkeeper, purveyor of milk, or occupier of a dairy.”

“ ‘ Medical officer of health ’ shall include any person duly authorised to act temporarily as medical officer of health.”

Let us now turn our attention to the law relating to infectious disease as applying to Scotland, the principal provisions of which are found under Part III. of the Public Health (Scotland) Act, 1897, in *Sections 44-71*.

By *Section 44*, the provisions of the Infectious Disease (Notifi-

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cation) Act, 1889, are to take effect in Scotland, whether this Act has or has not been adopted.

Power is given in *Section 45* to the medical officer to inspect at all reasonable times any premises where infectious disease is supposed to exist. Should admission be refused, he may apply to a sheriff, magistrate, or justice for a warrant, and in the event of his still being refused admission, a penalty is inflicted on the person obstructing.

Under *Section 46*, Local Authorities may, and when required by the Board shall, provide all necessary appliances for the destruction and disinfection of infected bedding, etc. Small districts may combine for providing such facilities.

Section 47 deals with the cleansing and disinfecting of a house or part thereof, or any articles therein, where, on the certificate of the medical officer of health or medical practitioner, it is desirable that such action shall be taken ; and the Local Authority may serve notice on the occupier of such house, calling upon him, or on the owner, if the house is unoccupied, to have the same and any articles likely to retain infection therein disinfected (or, as regards certain articles, destroyed) ; or the Local Authority may disinfect or destroy such articles or disinfect such house, and

“(2) if either

(a) within the time specified as aforesaid from the receipt of the notice, the person on whom the notice is served does not inform the local authority as aforesaid ; or

(b) having so informed the local authority, he fails to have the house, or part thereof, and any such articles disinfected, or such articles destroyed, as aforesaid, within the time fixed in the notice ; or

(c) the occupier or owner, as the case may be, without such notice gives his consent ;
the house, or part thereof, and articles shall be cleansed and disinfected, or such articles destroyed, by the officers of, and at the cost of, the local authority.

“(3) For the purposes of carrying into effect this section, the local authority may enter by day on any premises.”

Power is also given Local Authorities to remove any persons, not being themselves sick, from any house or tenement for the purpose of disinfecting the premises and articles therein which are infected ; and should objection be raised, the Local Authority may apply to a sheriff, magistrate, or justice for an order to so remove such persons. Local Authorities are empowered to provide shelter for the use of such persons so removed. Local Authorities

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are also to compensate owners or occupiers for any unnecessary damage which may be done in the process of disinfection, and for the purposes of the section, the word “ house ” includes any tent or van, or any ship lying in any sea, river, harbour, or other water, or *ex adverso*, i.e. from the opposite side of any place within the limits of the Local Authority.

Section 48 deals with the disinfection of bedding, etc. ; provision being made that it shall be taken away and brought back free of charge, and compensation paid for any unnecessary damage.

When it is necessary to prevent the spread of infectious disease, the Local Authority, on a certificate to that effect from their medical officer, may, under *Section 49*, require any person or company earning a living or deriving gain by the washing or mangling of clothes, to furnish them with a full and complete list of the names and addresses of all their customers, for which the Local Authority may pay at the rate of sixpence for every twenty-five names on the list ; but no payment shall exceed three shillings.

Section 50 is very important, and is as follows :—

“(1) If any person casts, or causes or permits to be cast, into any ashpit, or otherwise exposes any matter or article infected by infectious disease, he shall be liable to a penalty not exceeding five pounds, and if the offence continues, to a further penalty not exceeding forty shillings for every day during which the offence so continues after the notice hereafter in this section mentioned.”

“(2) The local authority shall cause their officers to serve notice of the provisions of this section on the occupier of any house, or part of a house, in which they are aware that there is a person suffering from infectious disease.”

By *Section 51*, it is a punishable offence to let for hire any house, or part of a house, in which there has been a person suffering from an infectious disease without having such house, or part of house, disinfected. In connection with this section, “ the keeper of an inn or hotel shall be deemed to let for hire part of a house to any person admitted as a guest into such inn or hotel.”

Section 52 imposes a penalty on any person letting for hire, or showing for that purpose, any house, or part thereof, in which there has been a case of infectious disease within six weeks previous, and who knowingly makes a false statement in connection therewith.

As the next section, viz. 53, is a very important one, we will take it in full, as follows :—

“ *Section 53*.—(1) Where a person ceases to occupy any house, or part of a house, in which any person has within six weeks previously been suffering from any infectious disease, and either—

(a) fails to have such house, or part of a house, and all

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articles therein liable to retain infection, disinfected to the satisfaction of the medical officer, as testified by a certificate signed by him, or such articles destroyed ; or

(b) fails to give to the owner or occupier of such house, or part of a house, notice of the previous existence of such disease, or

(c) on being questioned by the owner or occupier of, or by any person negotiating for the hire of such house, or part of a house, as to the fact of there having within six weeks previously been therein any person suffering from any infectious disease, knowingly makes a false answer,

he shall be liable to a penalty not exceeding twenty pounds.

“(2) The local authority shall cause their officers to serve notice of the provisions of this section on the occupier of any house, or part of a house in which they are aware that there is a person suffering from an infectious disease.”

By *Section 54*, powers are conferred whereby persons suffering from infectious disease, and who are without proper lodging or accommodation, or who are so lodged that proper precautions cannot be taken for preventing the spread of the disease, can be removed to a hospital.

This also applies to a person lodged in a tent, van, or room occupied by other persons, or to a person on board ship. In the event of objection being raised to the removal of the patient, an order may be granted by a sheriff, magistrate, or justice. A penalty is inflicted on any person obstructing an officer removing a patient by an order.

The Local Authority, under *Section 55*, may apply for an order to detain an infected person in hospital who is without proper lodging or accommodation.

Now, the next section is one of considerable importance, and reads as follows :—

“*Section 56*.—(1) If any person—

(a) while suffering from any infectious disease wilfully exposes himself without proper precautions against spreading the said disease in any street, public place, shop, inn, hotel, church, or any place used in common by persons other than members of the family or household to which such infected person belongs ; or

(b) being in charge of any person so suffering, so exposes such sufferer ; or

(c) knowingly gives, lends, sells, pawns, transmits, removes, or exposes, or permits to be washed or exposed in

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any washing-house or washing-green which is used in common by persons other than the family or household to which the infected person belongs, without previous disinfection, to the satisfaction of the medical officer or of some qualified medical practitioner, as certified by him in writing, any bedding, clothing, or other articles which have been exposed to infection from any such disease ; or

(d) takes, or permits to be taken, into the house, room, or place over which he has control, the body of any person who has died of an infectious disease, he shall be liable to a penalty not exceeding five pounds.

“(2) Provided that proceedings under this section shall not be taken against persons transmitting with proper precautions any bedding, clothing, or other articles for the purpose of having the same disinfected.”

Under *Section 57*, every parent or person having charge of a child who is, or has been, suffering from infectious disease, or who resides in a house in which there exists, or has within three months previously existed, who shall send such child to school without procuring a certificate from the medical officer certifying that the child and house are free from infection, shall be liable to a penalty.

By *Section 58*, “ No person suffering from an infectious disease, or who is living in an infected house, shall milk any animal or pick fruit or engage in any occupation connected with food, or carry on any trade or business likely to spread such disease.” A penalty is inflicted for violating the provisions of this section.

A penalty is imposed in *Section 59* on any owner or person in charge of a public conveyance who knowingly and willingly carries an infected person in a public conveyance ; and the penalty also may be imposed on any person who knowingly places in a public conveyance any person suffering from infectious disease.

Section 60 deals with the power of inspection of dairies, and the power to prohibit the supply of milk from a dairy in the district in connection with which the medical officer has evidence to prove that any person in the district is suffering from an infectious disease attributable to the milk from such dairy.

The medical officer shall examine the dairy and every person engaged therein and all persons resident on the dairy premises, and if accompanied by a veterinary surgeon, examine the animals in the dairy. The medical officer shall forthwith transmit his report, together with a report by the veterinary surgeon (if any), to the Local Authority.

Should the evidence prove that any person in the district is

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suffering from an infectious disease traceable to a dairy outside the district, the medical officer shall forthwith intimate the information to the local authority of the district in which the dairy is situated, and the medical officer of that district, accompanied by a veterinary surgeon, shall immediately visit, inspect, and report as aforesaid.

On receipt of the report, the Local Authority of the district in which the dairy is situated shall at once consider the reports and any other evidence that may be forthcoming, and shall either make an order requiring the dairyman not to supply any milk from such dairy until the order has been withdrawn, or resolve that no such order is necessary. Any order so made shall be withdrawn as soon as the medical officer is satisfied that the milk is no longer likely to cause infectious disease.

An appeal against such an order may be made to the sheriff, but the order remains in force pending the appeal being disposed of.

Dairymen must supply, if called upon by the Local Authority under *Section* 61 to do so, a list of their customers within twenty-four hours, and supply any information required.

The next section, viz. *Section* 62, is the same as *Section* 8 of the Infectious Disease (Prevention) Act, 1890, and prohibits the keeping of any body of a person who has died of infectious disease, unburied for more than forty-eight hours, except in a room not used at the time as a dwelling-place, or sleeping-place, or work-room, without the sanction of the medical officer or qualified medical practitioner.

Section 63.—The body of any person who has died of an infectious disease in a hospital shall only be removed from such hospital to the place of burial, if the medical officer certifies that in his opinion it is desirable that such should be the case to prevent the spread of infectious disease.

Section 64 deals with the disinfection of public conveyances used for conveying the body of a person who has suffered from an infectious disease.

In connection with public conveyances, the Local Authority may, under *Section* 65, make by-laws for securing the cleanliness and sanitary condition of public conveyances, and for preventing the overcrowding of same.

Section 66 gives powers to Local Authorities to provide hospitals. Two or more Local Authorities may combine for this purpose, while *Section* 67 makes provision for the conveyance of infected persons in suitable carriages.

Power is given in *Section* 68 to provide mortuaries, and in *Section* 69 a sheriff may, in certain cases, order the removal of a

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body of a person who has died of an infectious disease, to the mortuary.

These, then, are the provisions with regard to infectious disease in Scotland, and, as will be seen, they are similar to those laid down in the various Acts relating to infectious disease in England.

They call for little comment, as the digest of the sections given makes the meaning of each respective section plain enough to follow.

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Chapter IV

FACTORY AND WORKSHOP ACT, 1901

THIS Act consolidates the law relating to factories and workshops, and supersedes the Acts made under this head, of 1878, 1883, 1891, and 1895.

The work of carrying out the provisions of this Act forms a very important part of an inspector's duties, and to do this efficiently, it is very essential that he should have a clear conception as to the nature of the factory or workshop with which he may have to deal, and the powers conferred on him to carry out his work as inspector.

Broadly speaking, one might say a factory is a place where people are employed, and where mechanical means are introduced in connection with the work carried on therein. A workshop, on the other hand, may be said to be one where only manual labour is used, and where no mechanical power is employed. Work-places are where the place is neither a factory nor workshop, i.e. where no particular article is made, repaired, or altered, such as a hairdresser's shop, mason's yard, or a place where men are employed washing carriages, motors, etc.

We will deal with the legal definitions of these later in the chapter.

The principal powers of the Factory and Workshop Act are vested in His Majesty's Inspectors of Factories, acting under the direction of the Secretary of State, but certain provisions call for the action of the sanitary inspector or inspector of nuisances acting under the Local Authority.

We will therefore proceed to a study of the Act itself, with a view to ascertaining to what extent we may be called upon in dealing with this subject.

Part I. of the Act, under the heading of "Health and Safety," has the following provisions laid down :—

"*Section 1.*—(1) The following provisions shall apply to every factory as defined by this Act, except a domestic factory :—

(a) It must be kept in a cleanly state.

(b) It must be kept free from effluvia arising from any drain, water-closet, earth-closet, privy, urinal, or other nuisance.

(c) It must not be so overcrowded, while work is carried on

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therein, as to be dangerous or injurious to the health of the persons employed therein.

- (d) It must be ventilated in such a manner as to render harmless, so far as practicable, all the gases, vapours, dust, or other impurities generated in the course of the manufacturing process or handicraft carried on therein, that may be injurious to health.

“ (2) The provisions of Section 91 of the Public Health Act, 1875, with respect to a factory, workshop, or workplace not kept in a cleanly state, or not ventilated, or overcrowded, shall not apply to any factory to which this section applies.

“ (3) For the purpose of securing the observance of the requirements in this section as to cleanliness in factories, all the inside walls of the rooms of a factory, and all ceilings or tops of those rooms (whether those walls, ceilings, or tops are plastered to not), and all the passages and staircases of a factory, if they have not been painted with oil or varnished once at least within seven years, shall (subject to any special exceptions made in pursuance of this section) be limewashed once at least within every fourteen months, to date from the time they were last limewashed ; and if they have been so painted or varnished, they shall be washed with hot water and soap once at least within every fourteen months, to date from the time they were last washed.

“ (4) Where it appears to the Secretary of State that in any class of factories, or parts thereof, the provisions of this section with respect to limewashing, or washing, are not required for the purpose of securing therein the observance of the requirements of this Act as to cleanliness, or are by reason of special circumstances inapplicable, he may, if he thinks fit, by Special Order grant to that class of factories, or part thereof, a special exemption that the said provisions shall not apply thereto.

“ (5) A factory in which there is a contravention of this section shall be deemed not to be kept in conformity with this Act.”

It will be seen from this section that the provisions made with regard to ensuring a proper state of cleanliness in all factories, and the important points to note, are with regard to the nature of the cleaning of ceilings, walls, and tops. These may be either oil-painted, varnished, or limewashed, and the period between such operations shall not exceed seven years in the case of oil-painting, with washing with hot water and soap once at least in every fourteen months, and the renewal of a coating of limewash at least once in fourteen months, where the walls, etc., are not oil-painted or varnished.

We now come to the next section, which is also of importance from the sanitary inspector's point of view.

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“ *Section 2.*—(1) The provisions of Section 91 of the Public Health Act, 1875, with respect to a factory, workshop, or workplace not kept in a cleanly state, or not ventilated, or overcrowded, shall apply to every factory, workshop, and workplace, except any factory to which the last preceding section applies.

“(2) Every workshop and every workplace within the meaning of the Public Health Act, 1875, must be kept free from effluvia arising from any drain, water-closet, earth-closet, privy, urinal, or other nuisance, and unless so kept, shall be deemed to be a nuisance liable to be dealt with summarily under the law relating to public health.

“(3) Where, on the certificate of a medical officer of health or inspector of nuisances, it appears to any district council that the limewashing, cleansing, or purifying of any such workshop, or of any part thereof, is necessary for the health of the persons employed therein, the council shall give notice in writing to the owner or occupier of the workshop to limewash, cleanse, or purify the same, or part thereof, as the case may require.

“(4) Any person to whom notice is so given, failing to comply therewith within the time therein specified, shall be liable to a fine not exceeding ten shillings for every day during which he continues to make default, and the council may, if they think fit, cause the workshop, or part, to be limewashed, cleansed, or purified, and may recover in a summary manner the expenses incurred by them in so doing, from the person in default.

“(5) This section shall not apply to any workshop or workplace to which the Public Health (London) Act, 1891, applies.”

By this section will readily be seen the powers which are vested in Local Authorities and their officers. Reference is made to Section 91 of the Public Health Act of 1875, which will be dealt with under the heading of “Nuisances” in a later chapter ; still it may not be out of place here to take the subsection referred to, so that we may note its importance.

Section 91, subsection (6), reads :—

“(6) Any factory, workshop, or workplace (not already under the operation of any general Act for the regulation of factories or bakehouses), not kept in a cleanly state, or not ventilated in such a manner as to render harmless, as far as practicable, any gases, vapour, dust, or other impurities generated in the course of the work carried on therein, that are a nuisance or injurious to health, or so overcrowded while work is carried on as to be dangerous or injurious to the health of those therein employed, shall be deemed to be a nuisance liable to be dealt with summarily in manner as provided by this Act.”

Here, then, the Local Authority and their officers have powers

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for enforcing a proper state of cleanliness, proper means of ventilation, the carrying off of all noxious and offensive gases, vapours, etc., generated in connection with any work carried on therein. It must be noted, however, that these powers, as delegated to Local Authorities, do not apply to factories as defined by the Act itself, where the duty in the first place falls upon the inspector of factories.

The next section deals with the overcrowding of factories or workshops, and is as follows :—

“ *Section 3.*—(1) A factory shall for the purposes of this Act, and a workshop shall for the purposes of the law relating to public health, be deemed to be so overcrowded as to be dangerous or injurious to the health of the persons employed therein, if the number of cubic feet of space in any room therein bears to the number of persons employed at one time in the room, a proportion less than two hundred and fifty, or during any period of overtime, four hundred cubic feet of space to every person.

“ (2) Provided that the Secretary of State may, by Special Order, modify this proportion for any period during which artificial light, other than electric light, is employed for illuminating purposes, and may, by like order, as regards any particular manufacturing process or handicraft, substitute for the said figures of two hundred and fifty and four hundred respectively any higher figures, and thereupon this section shall have effect as modified by the order.

“ (3) There shall be affixed in every factory and workshop a notice specifying the number of persons who may be employed in each room of the factory or workshop by virtue of this section.”

We have already dealt with this question in a previous chapter of this work under the head of “ Ventilation.” Thus, a standard is here laid down with regard to the cubic capacity provided for each person.

It will also be noted that the Secretary of State is vested with powers to alter and amend the standard of cubic space per person under certain trade conditions. Should the Local Authority fail to take action with regard to any case reported to them under this Act, the Secretary of State may take action as follows :—

“ *Section 4.*—(1) If the Secretary of State is satisfied that the provisions of this Act, or of the law relating to public health in so far as it affects factories, workshops, and workplaces, have not been carried out by any district council, he may, by order, authorise an inspector to take, during such period as may be mentioned in the order, such steps as appear necessary or proper for enforcing these provisions.

“ (2) An inspector, authorised in pursuance of this section,

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shall for the purpose of his duties thereunder, have the same powers with respect to workshops and workplaces as he has with respect to factories, and he may, for that purpose, take like proceedings for enforcing the provisions of this Act, or of the law relating to public health, or for punishing, or remedying any default as might be taken by the district council ; and he shall be entitled to recover from the district council all such expenses in and about any proceedings as he may incur, and as are not recovered from any other person."

The foregoing section is, for obvious reasons, rarely if ever called into operation, but it is important to note the powers conferred on the Secretary of State in the event of such an emergency occurring.

"*Section 5.*—(1) Where it appears to an inspector that any act, neglect, or default, in relation to any drain, water-closet, earth-closet, privy, ashpit, water supply, nuisance, or other matter in a factory or workshop, is punishable or remediable under the Act relating to public health, but not under this Act, that inspector shall give notice, in writing, of the act, neglect, or default, to the district council in whose district the factory or workshop is situate ; and it shall be the duty of the district council to make such inquiry into the subject of the notice, and take such action thereon, as seems to the council proper for the purpose of enforcing the law, and to inform the inspector of the proceedings taken in consequence of the notice.

"(2) An inspector may, for the purpose of this section, take with him into a factory or workshop a medical officer of health, inspector of nuisances, or other officer of the district council.

"(3) Where notice of an act, neglect, or default is given by an inspector under this section to a district council, and proceedings are not taken within one month for punishing or remedying the act, neglect, or default, the inspector may take the like proceedings for punishing or remedying the same as the district council might have taken, and shall be entitled to recover from the district council all such expenses in and about the proceedings as the inspector incurs, and as are not recovered from any other person, and have not been incurred in any unsuccessful proceedings."

Now, this section is important, as it gives the procedure between the factory inspector and the Local Authority.

Under subsection (1), we note that the inspector, on finding anything which requires to be dealt with under the laws relating to health, immediately sends a notice to the clerk of the Local Authority stating the name of the owner or occupier of the premises, the situation of same, the nature of the business carried on therein,

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the nature of the offence, and the section of the Act under which it is reported. This information is then passed on to the inspector of nuisances, sanitary inspector, or medical officer of health, according to which official it requires to be dealt with. A register of all such complaints is kept, and proceedings are at once taken to have the matter referred to in the notice remedied.

On the work being done, or proceedings taken for punishing the author of the act, default, etc., the official concerned will report the result of his actions to his Local Authority, who will notify the inspector of what has been done to discharge the terms of his notice.

Power is given under subsection (2), whereby the medical officer or inspector of nuisances may accompany the factory inspector, so that the work may be facilitated.

Should no action be taken by the Local Authority within one month of the receipt of the factory inspector's notice, then, under subsection (3) of this section, the inspector may carry out the work himself and recover the expenses in doing so, with the reservation that he cannot recover any expenses for an unsuccessful action.

Section 6 deals with the temperature of rooms in factories and workshops, while *Section 7* deals with the humidity of the atmosphere and ventilation in factories. Where the floors of any factory or workshop are liable to be wet during operations carried on therein, provision must be made under *Section 8* for the efficient drainage of such floors.

The next section is one of considerable importance, dealing as it does with sanitary conveniences in factories and workshops, viz. :—

“ *Section 9.*—(1) Every factory and workshop must be provided with sufficient and suitable accommodation in the way of sanitary conveniences, regard being had to the number of persons employed in, or in attendance at, the factory or workshop, and also where persons of both sexes are, or are intended to be, employed or in attendance, with proper separate accommodation for persons of each sex.

“ (2) The Secretary of State shall, by Special Order, determine what is sufficient and suitable accommodation within the meaning of this section.

“ (3) A factory or workshop in which there is a contravention of this section shall be deemed not to be kept in conformity with this Act.

“ (4) This section does not apply to the administrative county of London, or to any place where *Section 22* of the Public Health Acts Amendment Act, 1890, is in force.”

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Let us now look at the Order made under the above subsection (2), and of which the following is a copy :—

“FACTORY AND WORKSHOPS ACT, 1901

SANITARY ACCOMMODATION

The Sanitary Accommodation Order of August 1902

“In pursuance of Section 9 of the Factory and Workshops Act, 1901, I hereby determine that the accommodation in the way of sanitary conveniences provided in a factory or workshop shall be deemed to be sufficient and suitable within the meaning of the said section if the following conditions are complied with, and not otherwise :—

“1. In factories or workshops where females are employed or in attendance, there shall be one sanitary convenience for every 25 females.

“2. In factories or workshops where males are employed or in attendance, there shall be one sanitary convenience for every 25 males : provided that—

(a) in factories or workshops where the number of males employed or in attendance exceeds 100, and sufficient urinal accommodation is also provided, it shall be sufficient if there is one sanitary convenience for every 25 males up to the first 100, and one for every 40 after ;

(b) in factories and workshops where the number of males employed or in attendance exceeds 500, and the District Inspector of Factories certifies in writing that by means of a check system, or otherwise, proper supervision and control in regard to the use of the conveniences are exercised by officers especially appointed for that purpose, it shall be sufficient if one sanitary convenience is provided for every 60 males, in addition to sufficient urinal accommodation. Any certificate given by an inspector shall be kept attached to the general register, and shall be liable at any time to be revoked by notice in writing from the inspector.

“3. Every sanitary convenience shall be kept in a cleanly state, shall be sufficiently ventilated and *lighted*, and shall not communicate with any workroom, except through the open air or through an intervening ventilated space.

“4. Every sanitary convenience shall have a proper door and fastenings, and be so enclosed as to secure privacy.

“5. The sanitary convenience in a factory or workshop shall be so arranged and maintained as to be conveniently accessible to all persons employed therein at all times during their employment.

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“ 6. Where persons of both sexes are employed, the conveniences provided for each sex shall be completely separate, with separate screened approaches.

“ One of His Majesty’s Principal Secretaries of State.

“ HOME OFFICE,
“ WHITEHALL, *August 1902.*”

In districts where Part III. of the Public Health Acts Amendment Act, 1890, is in force, it is laid down in Section 22 of that Act that every building used as a workshop or manufactory, or where persons are employed or intended to be employed in any trade or business, must be provided with sufficient and suitable accommodation in the way of sanitary conveniences, while with regard to Scotland, Section 29 of the Public Health (Scotland) Act, 1897, empowers the Local Authority, by notice in writing to the owner or occupier of any factory (including workshop or workplace), or building in which persons are employed in any manufacture, trade, or business, to require them, or either of them, within a specified time to provide a sufficient number of water-closets or privies for the separate use of each sex.

Sections 14 and 15 make provision for safety from fires in factories and workshops, and lay the onus for the carrying out of such provisions on Local Authorities.

There is no necessity to deal at any great length with this aspect of the Act further than to say that all factories erected after 1st January 1892, and all workshops erected after 1st January 1896, must, if more than forty persons are employed therein, be furnished with a certificate from the District Council that it is provided with proper means of escape, in case of fire, for the persons employed therein.

We now come to a very important part of the Act, i.e. Part IV., which, under the heading of “ Dangerous and Unhealthy Industries,” deals first with *Bakehouses*.

Bakehouses are either factories or workshops within the meaning of the Act, according as to whether mechanical power is used or not in the trade or process carried on therein.

Certain important points are laid down in *Section 97*, which we will take as given in the Act itself, viz. :—

“ *Section 97.*—(1) It shall not be lawful to let or suffer to be occupied, or to occupy, any room or place as a bakehouse, unless the following regulations are complied with :—

- (a) A water-closet, earth-closet, privy, or ashpit must not be within, or communicate directly with, the bakehouse ;
- (b) Every cistern for supplying water to the bakehouse

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must be separate and distinct from any cistern for the supply of water to a water-closet ;

(c) A drain or pipe for carrying off fæcal or sewage matter must not have an opening within the bakehouse.

“(2) If any person lets, or suffers to be occupied, or occupies any room or place as a bakehouse in contravention of this section, he shall be liable to a fine not exceeding forty shillings, and to a further fine not exceeding five shillings for every day during which any room or place is so occupied after a conviction under this section.”

The foregoing section calls for little comment, as its provisions are clearly defined, and the student will do well to get a good grip of this and the next few sections relating to bakehouses, as they very often play an important part in certain examination questions.

Power is given in *Section 98*, whereby an inspector or District Council may prosecute the occupier of a bakehouse which is in such a state as to be, on sanitary grounds, unfit for such a purpose, and the court of summary jurisdiction hearing the case may inflict a fine, and may order means to be adopted by the occupier to remove the ground of complaint within a time specified.

Section 99 deals with the limewashing and painting of bakehouses, and is as follows :—

“(1) All the inside walls of the rooms of a bakehouse, and all the ceilings or tops of those rooms (whether those walls, ceilings, or tops are plastered or not), and all the passages and staircases of a bakehouse, must either be painted with oil or varnished, or be limewashed, or be partly painted or varnished and partly limewashed ; and

(a) where the bakehouse is painted with oil, or varnished, there must be three coats of paint or varnish, and the paint or varnish must be renewed once at least in every seven years, and must be washed with hot water and soap once at least in every six months ; and

(b) where the bakehouse is limewashed, the limewashing must be renewed once at least in every six months.

“(2) A bakehouse in which there is a contravention of this section shall be deemed not to be kept in conformity with this Act.”

The above section makes it very clear as to what must be done by the occupier of a bakehouse to keep the premises in the required state of cleanliness with regard to walls and ceilings. Limewashing is the commonest method of this means of cleansing. In most modern bakehouses, one finds the walls finished with glazed tiles or bricks, which lend themselves readily to periodic cleansing, and which have much to commend them for the purpose.

“*Section 100.*—(1) A place on the same level with a bake-

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house, and forming part of the same building, may not be used as a sleeping-place, unless it is constructed as follows ; that is to say :—

(a) is effectually separated from the bakehouse by a partition extending from the floor to the ceiling ; and

(b) has an external glazed window of at least nine superficial feet in area, of which at the least four and a half superficial feet are made to open for ventilation.

“ (2) If any person lets or occupies, or continues to let, or knowingly suffers to be occupied, any place contrary to this section, he shall be liable to a fine not exceeding, for the first offence, twenty shillings, and for any subsequent offence five pounds.”

It is worth while noting that with regard to “ retail bakehouses,” these regulations will be enforced by the District Council.

The medical officer of health is, for the purpose, given all the powers of entry, inspection, taking legal proceedings and otherwise of a factory inspector.

We now come to the consideration of *underground bakehouses*, as dealt with in *Section 101* of the Act.

Under Subsection (1) of this section, it is clearly laid down that an underground bakehouse shall not be used as a bakehouse unless it was used as such at the time of the Act coming into operation, and subject to this provision. An underground bakehouse shall not be continued to be used as such after the first day of January 1904, unless a certificate is granted by the District Council, stating that it is suitable for such purpose. (*Vide* Subsection (2).) The usual mode of procedure is for the bakehouse to be inspected by the medical officer of health, who will recommend the Council to grant a “ suitability certificate,” or otherwise.

In Subsection (3) we have a definition as to what is meant by an underground bakehouse, which states :—

“ (3) For the purpose of this section, an underground bakehouse shall mean a bakehouse, any baking-room of which is so situate that the surface of the floor is more than three feet below the surface of the footway of the adjoining street, or of the ground adjoining or nearest to the room. The expression ‘ baking-room ’ means any room used for baking, or for any process incidental thereto.”

By Subsection (4) a certificate of suitability shall not be granted by the District Council unless they are satisfied that it is in all respects suitable as regards construction, light, ventilation, and in all other respects.

Section 102 defines a “ retail bakehouse ” as any bakehouse or place—not being a factory—the bread, biscuits, or confectionery baked in which are sold, not wholesale but by retail, in some shop or place occupied with the bakehouse.

Let us now consider the application of the Act to Laundries,

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the provisions in respect to which are contained in *Section 103*, and of which the following is a brief summary :—

(a) Laundries must comply with the general requirements of the Act with regard to sanitary conditions, notice of occupation, etc.

(b) The period of employment per day shall not exceed

Children 10 hours

Young persons 12 „

Women 14 „

and the total for any one week must not exceed thirty hours for children and sixty hours for others, while there must not be more than five hours of continuous work ; half-an-hour for meal-time must intervene.

Notices stating times of employment and meal-times must be conspicuously affixed in the laundry.

(c) Women may work overtime under the following conditions :—

(1) No woman to work more than fourteen hours in one day.

(2) Overtime worked shall not exceed two hours in any day.

(3) Overtime limited to three days in one week, and thirty days in any year.

(d) In laundries where “ power ” is used :—

(1) Means must be provided, by fans or otherwise, for the extraction of steam from the washhouse, and for regulating the temperature of the ironing-rooms.

(2) The stoves for heating irons are to be separated from the ironing-rooms, and no gas irons giving off a bad smell are to be used.

(3) The floors of all washhouses are to be so constructed that water will drain freely away, and all floors must be kept in good condition.

There are three types of laundries exempted from the above provisions, viz. :—

(1) Prisons, reformatories, or institutions subject to inspection under Act of Parliament.

(2) Religious and charitable institutions.

(3) Business carried on by members of same family, dwelling there.

A very important part of the application of the Act to be dealt with is that under the head of “ *Home-Work*.” Occupiers of factories and workshops in special trades, as certified by Special Order of the Secretary of State, shall keep lists of the names and addresses of any outworkers—i.e. people they employ who do the work in their own homes. These lists are to be correctly made up and returned to the District Council at regular periods, and are to be open at all times for the use of the inspector.

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In this connection, the District Council may prohibit home-work in places where, first, the dwellings are injurious or dangerous to the health of the workers ; and second, in places where there is, or has been recently, a case of infectious disease.

In an Order issued by the Secretary of State, the trades applying to home-work, and with which the District Council may deal as unwholesome dwellings, have been fixed as follows :—

- (1) The making, cleaning, washing, altering, ornamenting, finishing, and repairing of wearing apparel, and any work incidental thereto ;
- (2) The making, ornamenting, mending, and finishing of lace, and of lace curtains and nets ;
- (3) Cabinet- and furniture-making, and upholstery work ;
- (4) The making of electro-plate ;
- (5) The making of files ; and
- (6) Fur pulling ;

while the Order dealing with infected dwellings applies by Order of the Secretary of State to the following trades :—

- (1) The making, cleaning, washing, altering, ornamenting, finishing, and repairing of wearing apparel, and any work incidental thereto ;
- (2) The making, ornamenting, mending, and finishing of lace and lace curtains and nets ;
- (3) Upholstery work ; and
- (4) Fur pulling.

The occupier of any factory or workshop who fails to supply such lists of home workers is liable to a penalty.

Notice of the commencement or occupation of a factory or workshop, and all particulars in connection therewith, shall be given to the factory inspector within a month, and a copy of this, such inspector will forward to the District Council.

At the entrance of every factory and workshop there must at all times be affixed :—

- (1) An Abstract of the Factory and Workshops Act, 1901 ;
- (2) Name and address of inspector of factories ;
- (3) Name and address of certifying surgeon ;
- (4) All notices and documents required by this Act ;

while in every factory and workshop a General Register must be kept, showing :—

- (1) Number of children and young persons employed therein.
- (2) Time of limewashing, etc.
- (3) Every exemption of which the occupier avails himself.

The District Council must keep a register of all the workshops within their district, with all necessary particulars.

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Let us now look at the most important of the *definitions* under this Act.

Factory.—By Section 149, a factory appears to be “any premises or place wherein or within the close, or curtilage, or precincts of which steam, water, or other mechanical power is used to move or work any machinery employed in preparing, manufacturing, or finishing any material; or where manual labour is exercised, together with mechanical power, by way of trade in making any article, or part of any article, altering, repairing, ornamenting, or finishing any article, or adapting for sale any article.

“*Workshop* means any premises, room, or place (not being a factory) in which, or within the close, curtilage, or precincts of which any manual labour is exercised by way of trade in the making, altering, repairing, ornamenting, or finishing of any article, or adapting any article for sale; and includes any premises, room, or place over which the employer of the persons working therein has the right of access or control.”

Factories are divided into two classes, namely, “textile” and “non-textile.”

Tenement Factory means a factory where mechanical power is supplied to different parts of the same building occupied by different persons, for any manufacturing process or handicraft.

Tenement Workshop means any workplace in which, with the permission of, or under agreement with, the owner or occupier, two or more persons carry on any work which would constitute the workplace a workshop, if the persons working there were in the employment of the owner or occupier.

Domestic Factory and *Domestic Workshop* each means a private house, room, or place which, though used as a dwelling, is, by reason of the work carried on there, a factory or workshop, and in which neither steam, water, nor other mechanical power is used in aid of the manufacturing process carried on there, and in which the only persons employed are members of the same family dwelling there.”

NOTE.—This is not applicable to the handicrafts of straw-plaiting, pillow-lace making, or glove-making; or where the work is carried on at regular intervals, and does not form the whole or principal means of living of the family.

Woman.—A female over eighteen years of age.

Young person.—A person who has ceased to be a child, and is under eighteen years of age.

Child.—A person who is under the age of fourteen years, and who has not (being of the age of thirteen) obtained the certificate of proficiency or attendance at school fixed for the time being by the Secretary of State with the consent of the Board of Education.

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Chapter V

THE SALE OF FOOD AND DRUGS ACTS, 1875, 1879, AND 1899

PROCEDURE AND TAKING OF SAMPLES, ETC.

IN the regulations regarding the duties of sanitary inspectors, issued by the Local Government Board, will be found the following :—

“ He shall, when and as directed by the Sanitary Authority, procure and submit samples of food, drink, or drugs to be analysed by the analyst appointed under ‘ The Sale of Food and Drugs Act, 1875,’ and upon receiving a certificate stating that the articles of food, drink, or drugs are adulterated, cause a complaint to be made, and take the other proceedings prescribed by that Act.”

From the foregoing clause, it will readily be observed that an intimate knowledge of the various Acts is essential to the successful carrying out of the inspector’s duties under this head.

The duties under the Food and Drugs Acts are very often rather unpleasant ones, and are surrounded by many legal and other difficulties.

Caution and extreme care, together with tact and diplomacy, are virtues the inspector requires in a large measure in this class of work.

Here let us consider one or two points which must be always kept in mind when sampling is being carried out.

The inspector must, of course, be accompanied by an assistant to act as witness to the transaction.

In making purchases, care must be taken to ask for the identical article wanted, so that no doubt may arise later as to what was asked for at the time of purchase.

Never try, or even attempt, to deceive a tradesman when making a purchase. Let all your actions be perfectly *bona fide*, and in doing so you will make your cases much better should they require to be taken into court.

It very often happens that the inspector has to employ agents in his endeavour to procure samples in the nature in which such articles are offered to the public ; in these cases, let the agents be reliable and intelligent people, keeping in view the fact that they will have to appear as witnesses if the case should go to court, and that as witnesses they will probably have to undergo a very severe cross-examination in the witness-box. Agents require to be

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changed after a time, as they become known by dishonest vendors and tradesmen, and so defeat the end in view.

We will now proceed to a study of the various **Food and Drugs Acts**, taking the **Act of 1875** first.

Under *Section 2* of this Act, we find the definition of the words “food” and “drug.”

Food, as defined here, has been amended by the Act of 1899, so we will take it under that head, and the term “drug” shall include medicine for internal or external use.

Section 3 states: “No person shall mix, colour, stain, or powder, or order, or permit any other person to mix, colour, stain, or powder, any article of food with any ingredient or material so as to render the article injurious to health, with intent that the same may be sold in that state, and no person shall sell any such article so mixed, coloured, stained, or powdered, under a penalty in each case not exceeding fifty pounds for the first offence; every offence, after a conviction for a first offence, shall be a misdemeanour for which the person, on conviction, shall be imprisoned for a period not exceeding six months with hard labour.”

“*Section 4*.—No person shall, except for the purpose of compounding, as hereinafter described, mix, colour, stain, or powder or order or permit any other person to mix, colour, stain, or powder any drug with any ingredient or material so as to affect injuriously the quality or potency of such drug, with intent that the same may be sold in that state, and no person shall sell any such drug so mixed, coloured, stained, or powdered, under the same penalty in each case respectively as in the preceding section for a first and subsequent offence.”

“*Section 5*.—Provided that no person shall be liable to be convicted under either of the two last foregoing sections of this Act in respect to the sale of any article of food, or of any drug, if he shows to the satisfaction of the justice or court before whom he is charged that he did not know of the article of food or drug sold by him being so mixed, coloured, stained, or powdered as in either of those sections mentioned, and that he could not with reasonable diligence have obtained that knowledge.”

In these sections just quoted, we have the description of offences as given in the Act, together with the provision which safeguards the vendor who unwittingly has sold an article not in conformity with the Act.

The next sections are also important, and should be carefully noted.

“*Section 6*.—No person shall sell to the prejudice of the purchaser any article of food or any drug which is not of the nature, substance, and quality of the article demanded by such purchaser,

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under a penalty not exceeding twenty pounds ; provided that an offence shall not be deemed to be committed under this section in the following cases ; that is to say :—

“(1) Where any matter or ingredient not injurious to health has been added to the food or drug, because the same is required for the production or preparation thereof as an article of commerce, in a state fit for carriage or consumption, and not fraudulently to increase the bulk, weight, or measure of the food or drug, or conceal the inferior quality thereof ;

“(2) Where the drug or food is a proprietary medicine, or is the subject of a patent in force, and is supplied in the state required by the specification of the patent ;

“(3) Where the food or drug is compounded as in this Act mentioned ;

“(4) Where the food or drug is unavoidably mixed with some extraneous matter in the course of collection or preparation.”

“ *Section 7.*—No person shall sell any compounded article of food or compounded drug which is not composed of the ingredients in accordance with the demands of the purchaser, under a penalty not exceeding twenty pounds.”

“ *Section 8.*—Provided that no person shall be guilty of any such offence as aforesaid in respect of the sale of an article of food or a drug mixed with any matter or ingredient not injurious to health, and not intended fraudulently to increase its bulk, weight, or measure, or conceal its inferior quality, if at the time of delivering such article or drug he shall supply to the person receiving the same a notice, by a label distinctly and legibly written or printed on, or with the article or drug, to the effect that the same is mixed.”

“ *Section 9.*—No person shall, with the intent that the same may be sold in its altered state without notice, abstract from an article of food any part of it so as to affect injuriously its quality, substance, or nature, and no person shall sell any article so altered without making disclosure of the alteration, under a penalty in each case not exceeding twenty pounds.”

Let us then consider the provision of these important sections. First, it will be noted that in Section 6 it is provided that “ no person shall sell to the prejudice of the purchaser any article of food or any drug which is not of the nature, substance, and quality of the article demanded by the purchaser.” Considerable difference of opinion prevails as to the exact interpretation of the words “ to the prejudice of the purchaser.”

It has been held that a sale is not to the prejudice of the customer if the purchaser was aware that the article demanded by him was not of the nature, substance, and quality he asked for.

Again, the provisions made with regard to exemptions under

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this section, as given under Subsections (1), (2), (3), and (4), ought to be carefully noted.

By *Section 7*, it will be seen that it is a punishable offence to sell any compound article of food or compound drug not composed of the ingredients asked for.

Sections 8 and 9 contain important provisions as regards the sale of an article, in that the person selling the article shall supply to the purchaser a notice by label to the effect that the same is mixed, or, as in the latter section, make to the purchaser a declaration of the fact that the article has been so altered.

This provision seems to have been aimed at the sale of skimmed milk, and also with regard to the sale of spirits in licensed premises.

It is very important to note in connection with the taking of samples under these sections, that the knowledge that a person is selling an inferior article is often in favour of the defender when it comes to a case in court.

As an example, we have the following case which was tried by Lord Chief Justice Cockburn in the Queen's Bench Division.

The inspector under the Food and Drugs Act charged a licenseholder with selling to an agent half a pint of whisky, which on analysis proved to be below the standard fixed. No label was put on the bottle into which the whisky was poured, and no observations made, but a notice was posted in the bar stating that "All spirits sold here are mixed." This notice the inspector had seen. The Lord Chief Justice, in giving his decision, stated: "The statute shows clearly how the vendor can secure himself against the presumption of his having acted fraudulently, and if he gives the notices required by the Act, he thus gets rid of all chance of having any information prepared against him. If, however, he does not follow the provisions of Section 8 with regard to the giving of notices, he must then prove in some other and satisfactory way that the transaction was good and free from fraud, and if he can show that he told the purchaser, or brought in any way to the knowledge of the purchaser that the article sold had mixed with it some matter which is not injurious to health, and which is not intended fraudulently to increase its bulk, weight, or measure, then I am of opinion that no offence has been committed within the provisions of the statute, inasmuch as there has been no such sale to the prejudice of the purchaser."

From the part of the speech quoted, it will be seen how careful one has to be in preparing a case for court.

In another case taken on 6th May 1896, a large firm of milk salesmen won their case because they displayed on the counter of their shop a notice which stated that while they purchased their milk under a warranty as to its purity and genuine quality, and

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took all possible precautions to ensure its being supplied to the customers in proper condition, they were unable to guarantee it as either new, pure, or with all its cream.

In still another case, a baker was charged with selling to an inspector a four-pound loaf of bread which, on analysis, was proved to contain forty-eight grains of alum. The baker and two of his men gave evidence that there was not, and never had been, any alum on the premises, and that they had no knowledge of there being alum in the flour baked. The case was dismissed, the justices being satisfied as to the innocence of the defendant.

Before leaving this part of the Act, it is well to note that great care must be taken with regard to which section the information is framed under.

For example, it is no use taking a case in connection with a prosecution for adulteration of milk under Section 6. The proceedings require to be under Section 9, which provides that “ no person shall, with intent that the same may be sold in its altered state without notice, extract from any article of food any part of it, so as to affect injuriously its quality, substance, or nature, and no person shall sell any article so altered without making disclosure of the alteration.”

Sections 10, 11, and 12 deal with the appointment of public analysts for the purpose of this Act.

Section 13 gives a list of those who may take samples under the Act, and is as follows :—

“ Any medical officer of health, inspector of nuisances, or inspector of weights and measures, or any inspector of a market, or any police constable under the direction and at the cost of the local authority appointing such officer, inspector, or constable, or charged with the execution of this Act, may procure any sample of food or drugs, and if he suspect the same to have been sold to him contrary to any provision of this Act, shall submit the same to be analysed by the analyst of the district or place for which he acts, or if there be no such analyst then acting for such place, to the analyst of another place, and such analyst shall upon receiving payment as is provided in the last section, with all convenient speed analyse the same, and give a certificate to such officer, wherein he shall specify the results of the analysis.”

This section is quite simple, and calls for no explanation, but the next one is very important, as it clearly defines the procedure in the taking of a sample. We must note, however, that this section is amended by Section 13 of the Act of 1899, and to save confusion, we will take it in its amended form, which is as follows :—

“ *Section 14.*—The person purchasing any article with the intention of submitting the same for analysis shall, after the pur-

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chase shall have been completed, forthwith notify to the seller or his agent selling the article, his intention to have the same analysed by the public analyst, and shall divide the article into *three parts* to be then and there separated, and each part to be marked and sealed, or fastened up in such a manner as its nature will permit, and shall, if required to do so, deliver one of the parts to the seller or his agent. He shall afterwards retain one of the said parts for future comparison, and submit the third part (if he deems it right to have the article analysed) to the analyst."

In connection with this section, there are one or two important points which ought to be specially noted.

It has been proved that an essential condition is that the notification, as required by section, must be given in making a purchase, i.e. "that the sample had been purchased for the purpose of having it analysed by the public analyst."

Another point is that the sample must be divided into three parts. As an instance of how one might very easily lose a case, the following example will show.

A milk vendor, reputed for the poor quality of his milk supply, was approached by an inspector who asked to be supplied with a certain quantity of milk for the purpose of having the same analysed. The quantity ordered, however, was more than enough to fill the three bottles, and the result was that the inspector threw the surplus on to the street.

The sample proving on analysis to be a very bad one, the case was entered in the court, and the "defence" put forward the plea that the sample had been divided into four parts instead of three (three parts in the bottles and one minute part on the road), and this view was upheld, with the result that the charge against the milk vendor had to be withdrawn.

Again, when purchasing drugs, a mistake may be made by buying, say, six tubes or small bottles of any drug, and dividing them into three lots of two each. This has happened, and the court rightly held that the article had not been divided into three parts.

Numerous cases of a similar nature might be quoted, but this one will serve to show how careful the inspector must be in carrying out the provisions of the section.

We will explain a little later in the chapter the method of dealing with the fixing and wrapping of samples.

"Section 15.—If the seller or his agent do not accept the offer of the purchaser to divide the article purchased in his presence, the analyst receiving the article for analysis shall divide the same into two parts, and shall seal or fasten up one of those parts, and shall cause it to be delivered, either upon receipt of the sample, or when he supplies his certificate to the purchaser, who shall retain the

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same for production in case proceedings shall afterwards be taken in the matter.”

Here we have a provision which is rarely called into operation, as most vendors prefer to have one of the parts of the sample in their possession for future reference.

Section 16 deals with the sending of samples by registered post to the analyst if he resides outwith two miles from the person requiring the article to be analysed.

“ *Section 17*.—If any officer, inspector, or constable, as above described, shall apply to purchase any article of food or any drug exposed to sale, or on sale by retail on any premises, or in any shop or stores, and shall tender the price for the quantity which he shall require for the purpose of analysis, not being more than shall be reasonably requisite, and the person exposing the same for sale shall refuse to sell the same to such officer, inspector, or constable, such person shall be liable to a penalty not exceeding ten pounds.”

In many cases, the unscrupulous vendor, rather than sell an article which he knows will lead him into trouble, or if he has been already convicted, and knows that the penalty, if again convicted, may be a heavy one, may refuse to sell, and this section gives power to deal with such seller, and to have a penalty inflicted.

Section 18 gives the nature of the analyst’s certificate, which is set forth in a schedule to the Act, and is as follows :—

FORM OF CERTIFICATE

To¹.....
I, the undersigned, Public Analyst for.....do hereby certify that I received on the.....day of.....19.....from².....
.....a sample of.....for analysis (which weighed³.....), and have analysed the same, and declare the result of my analysis to be as follows :—

I am of opinion that the same is a sample of genuine.....

or,

I am of opinion that the said sample contained the parts as under, or the percentages of foreign ingredients as under.

OBSERVATIONS⁴

As witness my hand this.....day of.....

A. A.,
at.....

¹ Here insert the name of the person submitting the article for analysis.
² Here insert the name of the person delivering the sample.
³ When the article cannot be conveniently weighed, to be left blank.
⁴ Analyst’s opinion as to whether mixture, if any rendered article unpalatable, etc.

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Section 20 deals with the taking of proceedings by the purchaser of the sample, when he has received a certificate from the analyst who has analysed the article, and from which it appears that an offence against some one of the provisions of the Act has been committed.

“*Section 21*.—At the hearing of the information in such proceedings, the production of the certificate of the analyst shall be sufficient evidence of the facts therein stated, unless the defendant shall require that the analyst shall be called as a witness, and the parts of the article retained by the person who purchased the article shall be produced; and the defendant may, if he think fit, tender himself and his wife to be examined on his behalf, and he or she shall, if he so desire, be examined accordingly.”

It is worth while noting that this section requires the production in court of the part of the article retained by the purchaser. This is very important, as in a case of a prosecution for weak milk, the purchaser could not produce the third part of the sample, as it had inadvertently got broken, and because of that the case was dismissed.

The justices trying a case under the Act, are given powers under *Section 22* to cause the article under discussion to be sent to the Commissioners of Inland Revenue to be analysed by the chemical officers of Somerset House, should a request be made by either party for such a proceeding.

Power of appeal to quarter sessions is given in *Section 23* to any person convicted of an offence under this Act.

By *Section 25*, the defendant in a case must be discharged if he can prove to the court that he bought the article in the same state as that in which it was sold, and with a written warranty to that effect; but he must give due notice to the purchaser that he is to rely on that line of defence, otherwise he will be liable for the costs incurred by the purchaser.

Section 27 imposes a term of imprisonment on any person who shall be guilty of forging or uttering, knowing it to be forged for the purposes of this Act, any certificate or any writing purporting to contain a warranty.

We now come to the **Sale of Food and Drugs Act Amendment Act, 1879.**

This Act was passed in order to meet the conflicting decisions given in regard to the meaning and effect of the Sale of Food and Drugs Act, 1875.

In *Section 2*, we have the first important amendment; and here it is laid down that when bought for analysis, the article is still sold to the prejudice of the purchaser.

Again in this section, it is made clear that an article bought

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for analysis need not be shown to be deficient in nature, substance, and quality—all three.

Under *Section 3*, the person appointed for the purpose may obtain a sample of milk at the place of delivery and submit the same to the analyst, while *Section 4* imposes a penalty on any person who refuses to give milk for analysis.

Section 6 deals with the reduction which is allowed in spirits, and is as follows :—

“ In determining whether an offence has been committed under *Section 6* of the said Act by selling, to the prejudice of the purchaser, spirits not adulterated otherwise than by the admixture of water, it shall be a good defence to prove that such admixture has not reduced the spirit more than twenty-five degrees under proof for brandy, whisky, or rum, or thirty-five degrees under proof for gin.”

The next Act which we will discuss is the **Margarine Act of 1887**, an Act which was framed for the better prevention of the fraudulent sale of margarine.

This Act is worked along with the various Food and Drugs Acts, and may truly be said to be part of them, as is also the Butter and Margarine Act, 1907, which we will discuss later.

In *Section 3* of this Act, we get the following definitions :—

“ The word ‘ butter ’ shall mean the substance usually known as butter, made exclusively from milk or cream, or both, with or without salt or other preservative, and with or without the addition of colouring matter.”

“ The word ‘ margarine ’ shall mean all substances, whether compounds or otherwise, prepared in imitation of butter, and whether mixed with butter or not, and no such substance shall be lawfully sold, except under the name of margarine, and under the conditions set forth in this Act.”

Sections 4 and *5* deal with the inflicting of penalties on any manufacturer, importer, or consignor, consignee, or commission agent guilty of an offence under the Act, and the exemption from penalty, if the person charged can prove that the offence was committed by another party.

Section 6 is important in that it has special regulations for the sale of margarine, viz. :—

“ Every person dealing in margarine in the manner described in the preceding section, shall conform to the following regulations :—

“ Every package, whether open or closed, and containing margarine, shall be branded or durably marked ‘ Margarine ’ on the top, bottom, and sides, in printed capital letters, *not less than three-quarters of an inch square* ; and if such margarine be exposed

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for sale by retail, there shall be attached to each parcel thereof so exposed, and in such a manner as to be clearly visible to the purchaser, a label marked in printed capital letters *not less than one and a half inches square*, 'Margarine'; and every person selling margarine by retail, save in a package duly branded or durably marked as aforesaid, shall in every case deliver the same to the purchaser in (or with) a paper wrapper, on which shall be printed in capital letters (*not less than a quarter of an inch square*), 'Margarine.'",

The words in the latter part of this section, here shown in brackets, are repealed by the Food and Drugs Act of 1899, which also states that the letters on the wrapper shall be capital block letters *not less than half an inch square*, and distinctly legible, and there must be no other printed matter on the paper. These regulations are rigidly enforced, and a sharp look-out must be kept for persons evading these provisions. It is no uncommon experience of an inspector to find margarine on sale with no display ticket shown. The usual answer given by the vendor is that it has been removed while serving a customer and forgotten to be put back again. In most up-to-date shops, however, the slab where the margarine is exposed for sale has a fixed notice of the requisite size shown.

By *Section 10*, any substance shown, and not marked "Margarine," shall be presumed to be exposed for sale as butter.

Reverting to *Section 7*, we find that the production of a written warranty or invoice, "that the vendor purchased the article as butter, and that he had no reason to believe that the article was other than butter, and that he sold it in the same state as when he purchased it," will be a good defence for any person charged with selling margarine for butter.

Section 8.—All margarine manufactured or imported into the United Kingdom and Ireland must be consigned as margarine, while it makes it lawful for any Officer of Customs or Inland Revenue, or any of the parties as enumerated in *Section 13* of the Sale of Food and Drugs Act, 1875, to procure samples for analysis, if there be reason to suspect an offence against the provisions of the Act.

Every manufactory of margarine must, under *Section 9*, be registered with the Local Authority of the district where they are situated.

A very important point is contained in *Section 10*, in that any officer authorised to take samples under the Sale of Food and Drugs Act, 1875, may (without going through the form of purchase provided by that Act, but otherwise acting in all respects in accordance with the provisions of the said Act as to dealing with samples)

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take for the purpose of analysis, samples of any butter, or substance purporting to be butter, which are exposed for sale, and not marked “Margarine.”

These, then, are the main provisions of the Margarine Act, 1887.

We will now turn our attention to the **Sale of Food and Drugs Act, 1899**, an Act made to amend the law relating to the sale of food and drugs.

Section 1 deals with imported margarine, margarine cheese, adulterated or impoverished butter or cream, condensed and separated or skimmed milk. These must be contained in packages or other suitable receptacles which must be conspicuously marked with a name or description indicating the nature of the article therein, such as “Margarine,” “Margarine Cheese,” “Machine-Skimmed Milk,” “Skimmed Milk,” etc. Here the power of taking samples, and that of carrying out prosecutions, are vested in the Commissioners of Customs.

Under *Section 2*, the Local Government Board (now the Ministry of Health) and the Board of Agriculture may direct any of their officers to procure samples of food for analysis. In doing so, such officers are empowered to act under the provisions as laid down in the Sale of Food and Drugs Act, 1875, with a very notable exception, and that is, he must divide any sample taken into *four* separate parts ; one of these parts he must send to the Board which he represents.

The Local Authority must, under *Section 3*, appoint a public analyst and instruct their officers to take samples. Should the Local Authority fail in the exercise of their duty in this respect, the Local Government Board or Board of Agriculture may act in default, and the Local Authority shall be held liable in all such expenses.

The Board of Agriculture are given powers under *Section 4* to make regulations as to the analysis of milk, butter, cream, or cheese.

Sections 5 and *6* extend the provisions of the Margarine Act of 1887 ; *Section 6*, with regard to the marking of margarine, that of margarine cheese, and the brand or mark ; “naming” these substances, when contained in any package, is to be on the package itself, and not on any attached ticket or label.

The letters required to be printed on the paper wrapper, in which margarine or margarine cheese is sold, shall be capital block letters *not less than half an inch long* and distinctly legible, and no other printed matter shall appear on the wrapper.

By *Section 7*, the Local Authority must notify the Board of Agriculture as to the registration of any margarine manufactory

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in their district. The occupier of such a factory must keep a register showing the quantity and destination of each consignment of margarine he sends out. Such manufactories shall be open at all reasonable times to inspection by an officer of the Board of Agriculture, so that he may inspect the process of manufacture, examine the register, and take samples.

In *Section 8*, we have the restriction on the amount of butter fat in margarine, as follows :—

“ It shall be unlawful to manufacture, sell, expose for sale, or import any margarine, the fat of which contains more than ten per cent. of butter fat ; and every person who manufactures, sells, exposes for sale, or imports any margarine which contains more than that percentage, shall be guilty of an offence under the Margarine Act, 1887 ; and any defence which would be a defence under *Section 7* of that Act shall be a defence under this section, and the provisions of the former section shall apply accordingly.”

By *Section 9*, when milk or cream is sold from any vehicle, can, or other receptacle in any highway or place of public resort, the name and address of the seller must be conspicuously inscribed on the vehicle or receptacle.

Section 11 states that every tin or other receptacle containing condensed, separated, or skimmed milk must bear a label clearly visible to the purchaser on which are the words, “ Machine-skimmed Milk,” or “ Skimmed Milk,” according as the case requires. Such print must be in large and legible type.

Sections 3 and 4 of the Sale of Food and Drugs Act Amendment Act, 1879, dealing with the taking of samples of milk in the course of delivery, are extended by *Section 14* of this Act to apply to every article of food. “ Provided that no sample shall be taken under this section except upon the request or with the consent of the purchaser or consignee.”

By *Section 16*, it is an offence to wilfully obstruct or impede any inspector or any other officer in the course of his duties under the Sale of Food and Drugs Acts, or to prevent, or attempt to prevent, the due execution of his duties by any gratuity, bribe, promise, or other inducement.

The question sometimes arises as to dealing with an article of food or a drug contained in an unopened tin or packet, and *Section 18* puts this matter right, viz. :—

“ Notwithstanding anything in *Section 17* of the Sale of Food and Drugs Act, 1875, where any article of food or drug is exposed for sale in an unopened tin or packet duly labelled, no person shall be required to sell it except in the unopened tin or packet in which it is contained.”

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Section 19, which deals with test samples, is very important, and makes provision that when any article of food or drug has been purchased for test purposes, any prosecution shall not be instituted after the expiration of twenty-eight days from the date on which the sample was purchased. In any prosecution, the summons shall state the particulars of the offence or offences alleged, and also the name of the prosecutor, and shall not be returnable in less than fourteen days from the day on which it is served, and there must be served therewith a copy of the analyst's certificate obtained on behalf of the prosecutor.

In *Section 20*, it is stated that a warranty or invoice shall not be available as a defence unless the person charged has, within seven days after the service of the summons, sent to the purchaser a copy of such warranty or invoice with a written notice stating that he intends to rely on such warranty or invoice in his defence, and he must also specify the name and address from whom he received such warranty or invoice, and that he has also sent a similar intimation to such person, and of his intention of relying on such defence.

Definitions are given in *Section 25* as follows :—

“ The expression ‘ margarine cheese ’ means any substance, whether compound or otherwise, which is prepared in imitation of cheese, and which contains fat not derived from milk.”

“ The expression ‘ cheese ’ means the substance usually known as cheese, containing no fat derived otherwise than from milk.”

Section 26 gives the amended definition of food as follows :—

“ For the purpose of the Sale of Food and Drugs Acts, the expression ‘ food ’ shall include every article used for food or drink by man, other than drugs or water, and any article which ordinarily enters into, or is used in the composition or preparation of human food ; and shall also include flavouring matters and condiments.”

The Sale of Food and Drugs Acts, 1875-1879 and 1899, together with the Margarine Act of 1887, may be cited as the Sale of Food and Drugs Acts, 1875 to 1899. (*Vide* Section 28 of the Act of 1899.)

Under date the 5th August 1901 are issued the Statutory Rules and Orders, 1901, No. 657, under the heading of “ Adulteration : Sale of Food and Drugs Acts,” and cited as **The Sale of Milk Regulations, 1901.**

These are issued by the Board of Agriculture, under powers conferred on them by Section 4 of the Sale of Food and Drugs Act, 1899.

The following are the provisions in full :—

“ (I) Where a sample of milk (not being sold as skimmed or

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separated or condensed milk) contains less than three per cent. of milk fat, it shall be presumed, for the purposes of the Sale of Food and Drugs Acts, 1875 to 1899, until the contrary is proved, that the milk is not genuine, by reason of the abstraction therefrom of milk fat, or the addition thereto of water.

“(2) Where a sample of milk (not being sold as skimmed or separated or condensed milk) contains less than 8·5 per cent. of milk solids other than milk fat, it shall be presumed for the purposes of the Sale of Food and Drugs Acts, 1875 to 1899, until the contrary is proved, that the milk is not genuine, by reason of the abstraction therefrom of milk solids other than milk fat, or the addition thereto of water.

“SKIMMED OR SEPARATED MILK

“(3) Where a sample of skimmed or separated milk (not being condensed milk) contains less than nine per cent. of milk solids, it shall be presumed, for the purposes of the Sale of Food and Drugs Acts, 1875 to 1899, until the contrary is proved, that the milk is not genuine, by reason of the abstraction therefrom of milk solids other than milk fat, or the addition thereto of water.

“(4) These regulations shall extend to Great Britain.”

In a circular issued by the Board of Agriculture in connection with the above regulations, the Board have appended the following remarks :—

“In the regulations, the limits, below which a presumption is raised that milk is not genuine, were necessarily fixed at figures lower than those which are usually afforded by genuine milk in which the proportion of milk fat and non-fatty solids very frequently exceed the percentages specified above.

“It is therefore important that Local Authorities should keep steadily in view the possibility of the artificial reduction of the quality of natural milk to the official limits by the abstraction of cream, or the addition of separated milk, or of water, and arrangements should be made for the taking of samples and the submission of same for analysis, whenever the existence of malpractice of the kind is suspected. In this connection, it may be observed that the evidence given before the Milk Regulations Committee (Cd. 491) tended to show that the practice of fraudulently mixing separated milk with new milk has become increasingly prevalent, particularly in some of the larger towns.

“Although the quality of genuine milk offered for sale will usually be well above the official limits of milk fat and non-fatty solids, there may occasionally, and especially in certain seasons

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of the year, be cases in which a sample of genuine milk may fall below these limits. To meet cases of this kind, it is suggested that in the absence of any special circumstances indicating that the case is a fraudulent one, the Local Authority might, in the first instance, call the vendor's attention to the analyst's report, and ask him whether he desires to offer any explanation, and if the explanation is one they are able to accept, they might, in the exercise of their discretion, refrain from the institution of proceedings, or withdraw any summons which, in order to prevent the failure of proceedings, by reason of the time limit imposed by the Act, it may have been necessary to take out. But it may be desirable that further samples of milk should be taken in such cases, in order that a satisfactory conclusion as to the character of the milk supplied may be arrived at.

“ CREAM.

“ The Milk Regulations Committee reported that the evidence submitted to them went to show that it was a common practice to add gelatine to cream for the purpose of giving it a fictitious appearance of richness and thickness.

“ Local Authorities are urged to take steps to ascertain whether this form of adulteration is practised within their districts, and if a public analyst reports the presence of gelatine or other similar substance in a sample of cream, the Local Authority concerned should consider whether the case is one in which proceedings might not with advantage be instituted under Section 6 of the Sale of Food and Drugs Act, 1875.

“ COLLECTION AND RETENTION OF SAMPLES.

“ It is desirable that, so far as may be found practicable, there should be uniformity of procedure in collecting and retaining samples of milk procured under the provisions of the Sale of Food and Drugs Acts, and the following recommendations have been drawn up for the guidance of the local officials employed in this work :—

- (1) The quantity to be purchased should not be less than one pint, except that it may be expedient to purchase only half a pint, in cases where there is reason to believe that the object of the purchase would be defeated if a greater quantity were demanded.
- (2) The division of the sample under Section 14 of the Act of 1875, as amended by Section 13 of the Act of 1899, should be made as equally as possible, so that the

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portion reserved by the purchaser may be not less than one-third of the whole.

- (3) The bottle used for each divided part should have a narrow neck, and be of such capacity that the milk may nearly or quite fill it. The shape of the bottle known as 'Winchester' is strongly recommended, but in any case, the bottles should have rounded sides in order to give security to the sample during transit by post or otherwise.
- (4) Corks only should be used, and these should always be new and sound, and fitting so tightly as to secure the contents without any aid from the wax which is subsequently used for sealing the sample. It is most desirable that the sealing should be carried out in such a way as to prevent any attempt to remove the cork. It is therefore recommended that the cork should be slit down to one-fourth of its length and the string drawn through and securely fastened round the neck, the ends being afterwards carried to the top of the cork and sealed thereon.
- (5) Special attention should be given that the reserved portion of milk be kept in as equable and cool a temperature as possible, pending its production in court in instances where proceedings are taken; and, if directed by the Justices to be referred to the Government Laboratory, it should be carefully packed so as to secure its safe transmission."

From the above-quoted circular, we get a good deal of useful information and guidance in this class of work, and it is because of the important nature of these remarks that the circular is quoted in full.

In the **Sale of Milk (Scotland) Regulations**, dated 13th February 1914, which, as its name implies, applies only to Scotland, Paragraph 3 of the Regulations of 1901 is modified to read:—

"Where a sample of skimmed or separated milk (not being condensed milk) contains less than 8·7 per cent. of milk solids other than milk fat, it shall be presumed, for the purposes of the Sale of Food and Drugs Acts, 1875 to 1907, until the contrary is proved, that the milk is not genuine, by reason either of the addition thereto of water, or the abstraction therefrom of milk solids other than milk fat."

In their circular regarding the above amendment, the Board of Agriculture state:—

"These Regulations amend the Sale of Milk Regulations, 1901,

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in so far as they relate to skimmed or separated milk, and replace the limit of 9 per cent. of total milk solids, on which, under Article 3 of those Regulations, a presumption that the milk is not genuine is based, by a limit of 8·7 per cent. of milk solids other than milk fat.

“ It has been represented to the Board that considerable practical difficulties arise in instituting proceedings in cases in which water has been added to skimmed milk, but owing to the fact that the milk has been imperfectly skimmed, the total solids have not fallen below 9 per cent. Thus, a sample containing 1·5 per cent. of fat and 7·5 per cent. of milk solids other than milk fat would probably contain over 12 per cent. of added water, but the total solids are up to the limit of 9 per cent. The present Regulations are intended to obviate these difficulties and to facilitate the prevention of the adulteration of skimmed milk with water.

“ The fixing of the percentage at 8·7 may result in some hardship in cases where the milk is imperfectly skimmed. Thus, if milk containing 3 per cent. of milk fat and 8·5 per cent. of milk solids other than milk fat is imperfectly skimmed so that 1·5 per cent. of milk fat remains, the proportion of milk solids other than milk fat will rise only to 8·63 per cent., and the Board would suggest that this point should be taken into account by your Local Authority in considering the question whether they should institute proceedings on the presumption of adulteration based on the Regulations in cases where the deficiency of milk solids other than milk fat is slight, and the skimmed milk contains a considerable proportion of milk fat.”

The remarks in these circulars cover all the explanation required in these Regulations, so we will now turn our attention to a summary of the provisions of the **Butter and Margarine Act of 1907**, which are worked in conjunction with the Sale of Food and Drugs Acts already enumerated.

By *Section 1* of this Act, the provisions which apply in *Section 9* of the Margarine Act of 1887, and amended in *Section 7* of the Sale of Food and Drugs Act, 1899, relating to the registration of margarine factories shall apply :—

“ (a) To butter factories—that is to say, any premises on which, by way of trade, butter is blended, reworked, or subjected to any other treatment, but not so as to cease to be butter, and

“ (b) Any premises on which there is manufactured any milk-blended butter—that is to say, any mixture produced by mixing or blending butter with milk or

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cream (other than condensed milk or cream), or in which there is carried on the business of a wholesale dealer in milk-blended butter.”

This Section also extends Section 7 of the Sale of Food and Drugs Act, 1899, with regard to registers of consignments of margarine so that they apply to milk-blended butter ; and further, it clearly stipulates that premises shall not be used as a butter factory if they form part or communicate (other than by a public street) with any other premises which are required to be registered by the Sale of Food and Drugs Acts. This latter part of the Section applies only to premises not so used previous to 1st January 1907.

Power of entry is given under *Section 2* to any officer of the Board of Agriculture, into any such premises for the purpose of inspecting the process of manufacture and the taking of samples. These same powers are extended to officers of the Local Authority empowered to take samples under the Sale of Food and Drugs Acts, if such officers are specially authorised by the Local Authority.

Section 3 deals with the prohibition of adulterants in any butter factory, and makes it an offence under the Act.

Under *Section 4* of this Act, we get the limit of moisture allowed in butter, viz. :—

“(1) If any butter which, when prepared for sale or consignment, contains more than 16 *per cent.* of water, is in any butter factory, or if any margarine which, when prepared for sale or consignment, contains more than 16 *per cent.* of water, is in any margarine factory, or if such butter or margarine is consigned from a butter or margarine factory, the occupier of the factory or the consignee will, as the case may be (whether the excess of moisture is due to adulteration or not), be guilty of an offence under this Act, unless the occupier or consignor proves to the satisfaction of the court that the butter or margarine was not made, blended, reworked, or treated in the factory.

“(2) Any person who manufactures, sells, or exposes or offers for sale, or has in his possession for the purpose of sale, any milk-blended butter which contains more than 24 *per cent.* of water, shall be guilty of an offence under this Act.

“*Section 5.*—(1) There shall be included in the list of articles, importation of which is made an offence by Section 1 of the Sale of Food and Drugs Act, 1899, the following articles :—

- (e) Butter containing more than 16 *per cent.* of water ;
- (f) Margarine containing more than 16 *per cent.* of water, or more than 10 *per cent.* of butter fat ;

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- (g) Milk-blended butter containing more than 24 per cent. of water ;
- (h) Milk-blended butter, except in packages conspicuously marked with such name as may be approved by the Board of Agriculture and Fisheries for the purpose ;
- (j) Butter, margarine, or milk-blended butter which contains a preservative prohibited by any regulation made under this Act, or an amount of a preservative in excess of the limit allowed by any such regulation ;

and in the said Section, the words ‘ Adulterated or impoverished butter (other than margarine) or,’ and the words ‘ butter or ’ shall be repealed.”

The power of making regulations under Section 4 of the Sale of Food and Drugs Act, 1899, is extended by *Section 6* of this Act, with regard to the making of regulations as to the proportion of any milk solid other than milk fat in any sample of butter, or milk-blended butter.

The Local Government Board may, under *Section 7*, make regulations with regard to the prohibition or limitation of preservatives used in butter, margarine, or milk-blended butter.

It is an offence under *Section 8* for a person dealing in margarine, “ if in any wrapper enclosing margarine, or on any package containing margarine, or on any label attached to a parcel of margarine, or in any advertisement or invoice of margarine, the person dealing in margarine describes it by any name other than either ‘ margarine ’ or a word combining the word ‘ margarine ’ with a fancy or other descriptive name approved by the Board.”

Section 9 deals with milk-blended butter, which may be sold under a name or names approved by the Board, and under the conditions applicable to the sale of margarine, the approved name being substituted for the word “Margarine” on the wrapper, etc. ; and the Board may insist on a description of the article, setting out the percentage of moisture or water it contains, being printed on the wrapper in which it is handed to the customer ; and further, milk-blended butter shall be consigned under such approved name which may be given to it.

By *Section 10*, a name shall not be approved by the Board for use in connection with margarine if it refers to or is suggestive of butter or anything connected with the dairy interest, and the same provision shall apply to milk-blended butter.

“ *Section 13*.—For the purpose of the Sale of Food and Drugs Acts, and in this Act, the expression ‘ margarine ’ shall mean any article of food, whether mixed with butter or not, which resembles butter and is not milk-blended butter.

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“The above definition shall be substituted for the definition of margarine in the Margarine Act, 1887.”

In connection with the Act just discussed, it is worthy to note one or two of the main points in a circular letter issued to Local Authorities in Great Britain by the Board of Agriculture in connection with the said Act, viz. :—

“Some of the principal provisions of the Act are intended, by means of regulation and inspection of the reworking of butter, to prevent its adulteration with milk or water, or with fats other than butter fat. To give full effect to these provisions, your Local Authority should take all practicable steps to insure that after 1st January 1908, no premises in their district shall be used for the blending or reworking of butter unless the premises have been registered in accordance with Section 1 of the Act.

“The Act provides that premises which form part of, or communicate otherwise than by a public street or road with, premises where margarine, margarine cheese, or mixtures of butter with milk or cream are manufactured or dealt in wholesale, shall not be used as a butter factory, and it will be the duty of the Local Authorities to refuse to register such premises as butter factories, and to take steps to prevent the use of such premises for the blending or reworking of butter. But if such premises were being used as a butter factory on 1st January 1907, and then formed part of or communicated with premises registered under the Acts then in force, the application for registration should be forwarded to the Board of Agriculture.

“Your Local Authority have power under Section 2 (2), specially to authorise an officer, who is empowered to procure samples under these Acts, to enter any registered butter factory. . . .

“Section 8 regulates the use of names in connection with margarine on wrappers, packages, labels, advertisements, and invoices. Every such name must include the word ‘Margarine’ printed in the same colour and in type as large as, or larger than, the rest of the name; and the Local Authority should instruct their officers to report to them all cases in which this provision is not complied with. If your Local Authority so request, the Board will forward to you lists of the names which have been approved by them.”

We have dealt at considerable length with the legal aspect of this subject, but, as was remarked at the outset of the chapter, it is very essential that a good grip be got of the various Acts and their means of operation.

In the taking of samples, let us consider one or two practical points at this juncture.

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First, as to the necessary articles the inspector requires to carry. These may be said to consist of :

Handbag, to carry the following articles :—

Bottles (scrupulously clean, of course) (about 8 oz. capacity).

Glass sample jars (2 to 8 oz. capacity).

Glass jug (1 quart capacity).

Glass filler.

New corks.

String and tapes.

Sealing-wax.

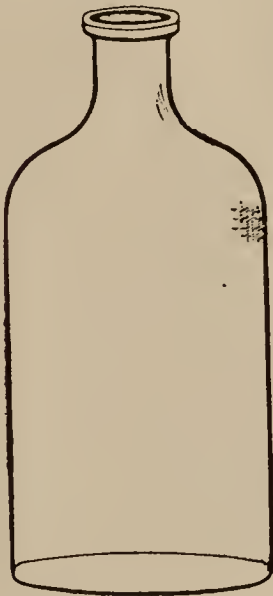
Official seal.

Labels.

Sample notebook.

Tapers or small sealing-wax lamp.

In some cases, a small lamp is carried for melting the sealing-wax, but ordinary tapers will be found quite satisfactory.



“WINCHESTER”
SAMPLING BOTTLE

Fig. 11



SAMPLING JAR

Fig. 12

The idea of the glass jug is to receive the milk in from the vendor, when the same is being sampled, the glass filler being used to pour the liquid into the bottles. The bottles, jug, and filler must, of course, be scrupulously clean. The corks and string must also be clean and new.

The bottles used should be “Winchester” bottles for preference ; these are oval-shaped in the body, and have a domed top, part of which ends in a narrow neck. In this form, there are the

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minimum of corners in the bottle itself, while the rounded nature helps to protect it in transit. Fig. 11 will give an idea of this type of bottle. When the article purchased for analysis is in powder form, solid glass jars of the type shown in Fig. 12 are used. These have a screw-on lid, and are indented on the outside to allow of the tape across the top of them being sealed.

The articles having been purchased, and divided into three parts into the bottles or jars, these are then corked, and the screw covers put on, as the case may be. With the bottles, the cork is secured by means of the string being passed round the neck, and brought up on top of the cork. The hot sealing-wax is then dropped on the top of the cork and string, and also at the points where the string leaves the neck of the bottle to cross the cork. While the wax is still hot, the impression of the official seal is made.

The same procedure is adopted with the jars, only in that case the lids are screwed tight up, and a piece of tape carried from one side of the jar to the other across the top, and sealed at each end of the tape and in the centre of the top.

A label is now attached to each jar or bottle, which is usually after the following fashion :—

Borough of.....
No. of Sample.....
Description of Article.....
Date of Purchase.....
Name of Inspector.....
Name of Witness

These labels are gummed and affixed to the bottle or jar ; but it should be noted that the name of the vendor from whom the article was purchased, or anything whereby he might be identified by the Public Analyst, must not appear on the label. The inspector will, of course, also enter all the necessary particulars in his sampling book.

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Chapter VI

DISEASES OF ANIMALS USED FOR FOOD OF MAN

THE Local Government Board, in setting forth the duties assigned to sanitary inspectors, have laid down the following :—

“ He (the sanitary inspector, or inspector of nuisances) shall from time to time, and forthwith upon complaint, visit and inspect the shops and places in which is exposed for sale, or in which is deposited for the purpose of sale or of preparation for sale, any animal, or any article, whether solid or liquid, intended for the food of man, and examine any such animal or article which may be therein.

“ If any such animal or article appears to him to be diseased, or unsound, or unwholesome, or unfit for the food of man, he shall seize and carry away the same himself or by an assistant, in order to have the same dealt with by a justice according to the provisions of the Public Health Act, provided that in any case of doubt arising under this clause, he shall report the matter to the medical officer of health, with a view of obtaining his advice thereon.”

It will readily be seen from this clause that an inspector must have some knowledge of food inspection in order that he may efficiently carry out all the duties for which he is responsible.

In most large towns, special food inspectors are appointed for the proper supervision of food supplies.

These inspectors have been specially trained, having qualified by examination for such work, and might therefore be reasonably called specialists.

But in every district, whether it be rural or urban, it is essential that an inspector shall have a sufficient knowledge of this subject in order to deal with any case which he may meet with in the execution of his duties, and this is one of the reasons why questions relating to the important business of diseases of animals and meat inspection are set at all examinations.

It is not possible here to impart sufficient knowledge in order to make the student sufficiently educated in this subject to be able to pass a meat inspector's examination, but it is our intention to deal with the subject in a brief and yet comprehensive manner in order that a good general knowledge will result.

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A subject of this nature cannot be fully acquired by simply studying from the book, but with the knowledge about to be imparted, coupled with daily observation and practical inquiry at all possible places and times, any one may soon become proficient in the matter.

We shall first deal with the live animal. It is a very rare occurrence for an inspector to seize a live animal, and if such a step be contemplated, he will be well advised to consult his medical officer of health or the veterinary surgeon for the district where he is, before so doing. Still, a knowledge of the appearance of the healthy animal is very essential when visiting cowsheds or herds, as the inspector may detect an ailing animal and in so doing he may be able to notify the veterinary surgeon, who will then give it his attention.

A healthy animal should be well nourished. It should be alert, and notice what goes on around it. The eyes should be clear and bright. The coat should be loose, soft, and move freely on the underlying structures. The hair should be smooth, and have a slight lustre. The coat should not be "patchy." The temperature in cattle, while in health, is about 101 degrees F. The trunk feels warmer to the touch than the ears, points of horns, and hoofs.

The muzzle of a healthy animal should be cool, the nostrils red and healthy looking, and from these there should be no discharge, except, perhaps, a little clear mucus, which should have no smell. The tongue should not be hanging out, or in any way projecting from the mouth.

The breathing should be easy and regular, and carried out without much noise. Healthy animals are always ready for their food, and will eat and drink greedily; while in healthy animals, rumination, or chewing of the cud, will follow immediately the food has been taken.

Healthy animals should not shiver or show signs of being in pain, and they should be able to get up and about with ease. The flesh should be tolerably firm and elastic when pressed with the hand or fingers.

The other side of the picture shows the signs in **an unhealthy animal** as follows:—

It will get up and about with difficulty, if at all.

Its coat will often be rough and "staring," and probably hide-bound.

Its temperature will be high, with ears, points of horns, and hoofs warm to the touch.

It will probably have shivering turns, and may wince with pain.

It will, moreover, stand with depressed head, look tired, have little or no inclination for food, and the eyes may be glassy.

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In the cow, the teats may be hot, if the animal is unhealthy, or the udder hard.

There may be a discharge from the nostrils, and in animals suffering from diseases of the respiratory organs, there may be coughing, and the breathing may be rapid ; the respirations may also be accompanied by violent movements of the thorax and abdominal walls.

In unhealthy animals, foam may collect at the mouth, and long stringy strands of saliva may escape therefrom.

The discharge from the bowels may be thin and watery, while mucus or blood may be present, and the whole have a very disagreeable odour.

The urine from healthy animals is of clear amber colour, passed in a long steady stream, while that from unhealthy animals may be thick, muddy, and sometimes mixed with mucus, having a very unpleasant smell.

Before commencing this subject proper, it may be as well to give the names by which various classes of animals are known. These are :—

Bovines—

Bull implies entire male animal.

Bullock implies castrated male animal.

Steer “ “ “ “ under two years.

Cow “ female after having had young.

Heifer “ “ before having young.

Barren cows imply those never in a state of pregnancy.

Dry “ “ “ not giving milk.

Calves imply young, up to age of about eight months.

Sheep—

Ram or tup implies entire male,

Wether “ castrated male

Ewe “ female after having young.

Gimmer “ “ before “ “

N.B.—Wethers and gimmers are described as hogs up to two years of age.

Shearlings imply sheep after first shearing.

Pigs—

Boar implies entire male.

Hog “ castrated male.

Sow “ female after having young.

Gelt “ “ before “ “

Spaid “ “ with womb removed when young.

N.B.—Spaids may easily be identified by mark or scar on flank.

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COMPARATIVE ANATOMY.

- Ox head, bone thicker and stronger than horse.
 „ neck bones shorter.
 „ tongue rough, pointed, nine bones ; horse tongue smooth, blunt, five bones.
 „ epiglottis semicircular ; horse's pointed.
 „ teeth on lower jaw only, while horse has teeth on both jaws.
 „ neck, thinner groove in spine of scapula.
 „ radius bone (upper fore leg) shorter and straighter than horse's.
 „ sternum (breast) bone, broad and flattened ; horse's keel-shaped.
 „ ribs (thirteen pairs) broader, flatter, less arched, and united to spine cartilages by joints. In the horse there are eighteen pairs of ribs with fixed union. Horse ribs are thinner and more arched.
 „ sacrum more arched than in horse.
 „ pelvis longer and narrower than in horse.
 „ feet, bones cloven ; horse's close.
 „ kidneys lobulated, about $1\frac{1}{4}$ lbs. each ; horse kidneys—right, heart-shaped, left, bean-shaped—about 1 lb.

The pelvis is a bony basin-shaped structure composed of the pelvic or aitch bones and lower sacral bones of the spine, which contain the bladder, rectum, and generative organs.

The following table of comparisons will also be found of use :—

Animal.	Ribs.	Heart.	Lungs.	Liver.	Spleen.	Kidneys.
Horse .	18 pairs	6 lbs.	$7\frac{1}{2}$ to 8 lbs.	11 to 12 lbs.	3 lbs.	1 lb.
Ox .	13 „	$4\frac{1}{2}$ lbs.	$7\frac{1}{2}$ to 8 lbs.	12 to 14 lbs.	$1\frac{1}{2}$ to 2 lbs.	2 lbs.
Pig .	14 „	$\frac{1}{2}$ lb.	$1\frac{1}{2}$ to 2 lbs.	$1\frac{1}{2}$ to 2 lbs.	$2\frac{1}{2}$ ozs.	...
Sheep .	13 „	$\frac{1}{2}$ lb.	$1\frac{1}{2}$ lbs.	$1\frac{1}{2}$ lbs.	2 ozs.	...
Goat .	13 „	...	...	...	...	...

Livers.—These vary in size and shape, the following being the normal shape of this organ :—

The liver of the horse has three distinct lobes—a left, middle, and right—and it may easily be recognised by the absence of the gall bladder, which the livers of the ox, sheep, and pig all possess.

The ox liver is a large reddish-brown organ ; its borders are sharp and firm and elastic to the touch. It is made of four lobes—a right and left, which are large, and two which are smaller in size ; these are situated above and behind the main mass of the liver. The gall bladder is situated on the posterior side of the organ.

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The sheep and goat livers resemble that of the ox, only, of course, being on a much smaller scale.

The liver of the pig has five distinct lobes, and its whole surface is lobulated, with characteristic mottled markings. It is a red-brown in colour, and is said to consist of four lobes and a “ thumbpiece.”

Kidneys.—These are two in number, and are situated in the region of the upper loin, one on each side of the vertebral column. They should be enveloped in an extensive layer of fat. Normally, they are of a reddish-brown colour and of firm consistency. Each kidney has a thin membranous covering or capsule which strips off easily in a healthy organ.

In the ox, the kidneys are oval and lobulated. The right kidney is attached to the abdominal wall, the left being free or “ floating.”

In pigs, sheep, and goats, the kidneys are not lobulated, and are smooth and bean-shaped.

The horse kidneys are also smooth, the left is bean-shaped, and the right heart-shaped or resembling a cocked hat.

Stomach.—In the ox, the stomach occupies the major part of the abdominal cavity. This organ is a sack-like structure, the walls consisting of three layers, a thick mucous membrane lining the interior, a peritoneal external covering of a white or bluish-grey colour, while there is a strong muscular coat between these two. This stomach is divided into four separate compartments, called (1) Rumen, or paunch, (2) Reticulum, or honeycomb, (3) Omasum, or many plies, and (4) Abomasum, or rennet-bag. 1, 2, and 3 sections of the stomach take part in maceration, with digestion proper taking place in the abomasum or fourth section of the stomach.

In the sheep and goat the stomachs are similar in structure to that of the ox.

The stomach of the horse and pig are of single compartments, that of the horse being small in comparison with the size of the animal, while that of the pig, on the other hand, is large compared with the size of the beast.

As tripe is made from the stomach of the ox, it is very essential to see that these organs are thoroughly cleaned by the tripe cleaners. When oxen stomachs are not properly cleansed they putrify very readily, and in this way the tripe is rendered unfit for human food.

Calves' stomachs are used in making rennet for the making of cheese, curds, etc., while from the stomach of the pig pepsin is largely manufactured.

Spleen.—The spleen of the ox lies on the left side of the rumen, to which it is attached. In shape it is of an extended oval,

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flatly compressed. In colour, it may be dark red, greyish-blue, or reddish-brown. It should be firm and elastic in consistence.

The spleen of the sheep is in all respects similar to that of the ox, although smaller in size.

The horse spleen is sickle-shaped, pointed at one end, and of a bluish-white or violet colour.

In the pig, the spleen is tongue-shaped and usually of a reddish-brown colour.

Heart.—The heart of the ox is pear-shaped and more conical than that of the horse. As a rule, the fat on the heart of the ox is paler and of a firmer consistency than that of the horse. Two other distinguishing features are that the heart of the ox has a larger fat deposit on it than that of the horse, while at the base of the heart of the ox will be found a bone ; this is absent in the case of a horse.

Respiratory Organs.—These consist of the nostrils, larynx, heart, wind-pipe or trachea, and lungs. As will be readily understood, they are similar in different animals, differing in size only.

The organs are situated as follows :—

The thoracic cavity contains the lungs and heart.

The abdominal cavity contains the stomach, spleen, liver, intestines, and kidneys.

By the *mesentery* is meant the fatty matter surrounding the intestines. The *omentum* or caul is the fatty matter surrounding part of the stomach and intestines.

There are three serous membranes in the carcase, namely, the pleura, peritoneum, and pericardium.

The udder of the cow is composed of two symmetrical halves, placed against each other. These halves are again divided into two halves, each part having its own teat, at the base of which is the milk sinus or cistern. The udder really consists of four glands, each one having its separate teat.

Intestines.—The intestines of the ox consist of what is known as the small intestine, which is 140 feet long, and is divided into the duodenum, jejunum, and ileum ; then we have the ileo-cæcal valve, after which we have the large intestine, measuring 36 feet long and divided into three parts, called the cæcum, colon, and rectum.

By **offal** is meant the head, hide, feet, and all internal parts of an animal except the kidneys ; in the case of pigs, however, only the internal parts, less the kidneys, are known as offal.

A few more explanations as to some of the terms may not be out of place here.

A **sweetbread** is the thymos or thymoid glands, situated, one on the lower side of the trachea, the other on the pericardium.

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The **pancreas** is a whitish conglomerate gland of irregular shape situated beneath the stomach and pouring its secretion into the alimentary canal during digestion. This is one of the most important of the digestive organs.

The **alimentary canal** is the great duct or intestine by which aliments are conveyed through the body and the useless parts evacuated.

Aliment infers that which nourishes. Thus, food, nutriment, or anything which feeds or adds to a substance in natural growth.

Lymphatic Glands.—Throughout the carcase will be found chains of lymphatic glands. These under normal conditions are white and creamy in pigs, and mottled blue, grey, or creamy in oxen. Abdominal glands are, as a rule, softer and rounder than thoracic glands.

A knowledge of the teeth of animals is often of great importance, and a few points regarding these will be of assistance in determining not only the age, but the nature of the animal. The mature ox has eight incisors on the front of the lower jaw ; the upper jaw is devoid of teeth at the front, their place being taken by a hard horny pad. In the posterior part of both jaws are molar teeth, twelve on each jaw ; these are used in grinding the food when the animal is ruminating.

Under one year, bovines still have their milk teeth, which are small in size and eight in number.

These milk teeth are cast and replaced by permanent teeth at definite ages as follows :—

The central are up at two years.

„ middle „ „ three „

„ lateral „ „ four „

„ corner „ „ five „

These names are derived by commencing with the central teeth and working outwards.

After five years, the teeth wear down and become ringed.

In animals of ten years or more, the teeth appear much worn, project far out from the gums, and are widely “ spaced.”

In the horse there are twelve incisor teeth, six on the lower jaw and six on the upper ; and in addition to these, four canine teeth, called tusks, make their appearance in the male animals.

Before passing on to the various diseases with which we have to deal, let us look at one or two points in connection with the appearance of good meat, fat, etc.

Good meat should be firm and elastic to the touch, moist, but not wet, and, except in the case of pork, veal, and lamb, bright red in colour. If the animal has been well fed, the flesh has a

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marbled appearance and has a fresh, not a disagreeable, smell. The colour of meat may be said to be :—

From cattle, light red, varying to dark red with age.

„ calves, pale red, whitish when milk-fed, and has “ silky feel.”

„ sheep, light red or brick red ; dark in old sheep.

„ pigs, pale red or pink.

With regard to the texture of the meat itself, that of the bull is coarse, dark in colour, less juicy, has a coarse, dry feel to the touch, is less fatty in proportion to muscle than in the cow, the fat being generally white and firm.

Cow flesh is bright in colour, and not so coarse to the touch. The fat is not so white, and is in layers between the muscles. In Jersey cows, the fat is of a distinctive yellow colour, and there is a comparatively small amount of muscle.

Fats—

Ox fat is yellowish white, firm, fresh, and pleasant to taste.

Horse fat is yellow, never sets, oily, and has a sickly smell and taste.

Sheep fat is white, firm, and crisp.

Pig fat is white, soft, and greasy.

Plucks—

A pig's pluck consists of the trachea, larynx, œsophagus, lungs, heart, and liver.

We will now proceed to a study of the various diseases which the inspector may meet with and deal with, in as concise a manner as possible.

Tuberculosis may be said to be the most common disease with which we have to deal. This disease affects between 20 to 30 per cent. of our cattle, 5 per cent. of these cases being tubercular udders in cows.

Of pigs, 5 per cent. are said to be tubercular, and 93 per cent. of these will have the lesions of the disease in the submaxillary glands of the neck.

Tuberculosis does not affect sheep or horses. These animals seem to be immune from it.

There are three forms of tubercular degeneration.

1. *Caseation*, where nodules are present. These nodules have a yellowish (cheesy) centre, and are surrounded by a greenish zone of firmer consistency. These may appear in small quantities or run to large masses.

2. *Calcification*.—Here the nodules are gritty on section.

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3. *Fibrosis*, showing abatement of the disease, the nodules being surrounded by a ring of hard, fibrous tissue.

In this disease, the appearance of the carcasses will differ according to the various stages of the trouble.

The lesions may be found adhering to the pleura (mucous membrane covering the thoracic cavity), to the lungs or the peritoneum, in the lymphatic glands throughout the carcase or near the organs, in the lung substance, the liver, or the kidneys.

In cases where the disease has attacked the lungs or lining of the chest (pleura), an inflammatory condition will have been set up, and the disease will be easily recognisable by the nodules appearing in bunches resembling "grapes," a name by which many butchers refer to the disease.

The disease in bovine animals may be entirely confined to the thoracic cavity, or to the peritoneal or abdominal cavity, in which case it is known as "*localised*," but should the lesions be found in both these cavities, or in the lymphatic glands throughout the carcase, then the disease is what is known as "*generalised*."

We shall have more to say regarding localised and generalised tubercular carcasses in the next chapter.

In cases of tubercular liver, the exterior may be slightly roughened, and the nodules may appear on the surface of the organ.

A tubercular carcase once seen will not readily be forgotten by the student in his further studies.

In addition to tuberculosis, the following diseases are declared to render meat unfit for human food : cattle-plague, pleuro-pneumonia, sheep-pox, cow-pox, influenza, rheumatism, black-quarter, splenic apoplexy, pig-typhoid, swine fever, quinsy, and anthrax.

Cattle-plague (Rinderpest).—Where this disease has been, the air passages and intestines have a pronounced red appearance. In the intestines will be found a blood-coloured fluid, and in the later stages of the disease there will be dark-coloured patches on the heart and intestines, and "zebra" like markings on the rectum. On examination of the throat and nostrils, there will be found cheesy deposits. The kidneys will be congested, lungs congested and often containing fluid, liver usually swollen, stomach ulcerated and congested, the lymphatic glands dark red in colour, blood dark and thick, and the flesh usually dark in colour.

Pleuro-pneumonia.—The most noticeable feature in this disease is the change in the colour of the lung substance, which, instead of being a bright pink colour, as in a healthy organ, will have changed to a grey mottled with purple, red, and blue spots ; they will also be congested, and may show signs of adhering to the pericardium or heart-sac. The pleura will be thick and rough-

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ened, while the chest cavity may contain a yellow fluid. The meat is dark in colour and looks ill-bled.

Sheep-pox resembles somewhat the disease of smallpox in a human being in appearance, although in the case of sheep the pustules may be larger than those of the human malady. The mucous membrane is the seat of the trouble, and the lungs will be found spotted with the virus of the disease. The joints and hoofs may be swollen and inflamed, and a discharge in the nostrils. The lymphatic glands are usually inflamed and enlarged. The meat is soft, moist, and friable, and has a disagreeable smell, and the carcase may be much emaciated.

Cow-pox is an eruption on the udder of cows, the pustules often breaking and forming running sores.

As the disease is usually very severe, there may have been a good deal of diarrhœa and fever, and the meat may have suffered as a consequence.

Influenza.—In cases of this disease, the intestines and other viscera of the abdomen are patchy. The meat is dark, ill-bled, soft, and watery.

Rheumatism shows thickened and stiff joints, with deposits and fluid. The disease may have caused abdominal trouble, and for this reason the intestines should be carefully noted. The flesh is charged with a watery fluid, and is usually very sour.

Blackquarter, or Splenic Fever, usually affects only one quarter of the animal, which is either across the loins or a limb. The part affected is much swollen and contains a bloody serum. The meat is almost black in colour and smells like rancid butter. The intestines are usually congested and blood-stained. The spleen is enlarged and dark-coloured, and its substance usually broken up, while the liver is often congested. The kidneys, too, are usually congested and blood-stained.

Splenic Apoplexy, or Braxy.—In sheep, this disease resembles splenic fever with head symptoms. The spleen will be very much enlarged. The carcase becomes rapidly “blown.” The flesh is much blood-stained. There is abundant peritoneal liquid, and this is extremely opaque, and is like tissues coloured with liberated blood pigment.

Pig Typhoid (also known as Swine Plague or Hog Cholera).—This disease, as the name implies, affects pigs. There are diffused patchy rednesses on the skin, small ulcers on the mouth and throat coverings, and ulcers on the intestines, while the stomach will be congested. The liver, in severe cases, will also be enlarged.

Swine Fever.—This is a very highly infectious disease. Thus, there will be an acute inflammatory condition of the skin and mucous membranes, and the lungs may also be congested.

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The mesenteric glands will be enlarged and strawberry-coloured, and the intestines will contain a blood-coloured matter. The characteristic lesion of the disease will be found in the cæcum, this part of the intestines being badly ulcerated with the lesions. This part is the seat of the disease, and calls for careful attention, as will be seen later. There may also be an eruption of the skin.

Quinsy or “**Strangles.**”—In this disease, there are glandular swellings of the neck and sore throat ; the swelling may extend to the forequarters. The throat is dropsical, and sometimes part of it mortifies.

Anthrax, also known as Splenic Fever or Splenic Apoplexy, and as Woolsorters’ Disease in human beings, may be found in cattle, sheep, and horses, but occurs very rarely in pigs.

The disease in the form known as Malignant Pustule or Woolsorters’ Disease may be contracted by butchers and others who handle anthrax carcasses, hides, wool, or hair, while cases have been known to occur where the patient has used a shaving-brush containing bristles which have come from an infected animal. The post-mortem appearance in this disease is very characteristic. The muscular tissue is very dark in colour, and is soft and sticky, and shows signs of hæmorrhages. The blood-vessels are full of engorged blood. The blood is tarry and watery and does not coagulate.

The spleen is greatly enlarged, sometimes to two and three times its normal size, and in many cases it is ruptured.

It will usually be found to be a dark-red colour, its section very soft and friable, and its condition is often said to resemble black-currant jelly. The liver is enlarged and congested. The intestines contain partially clotted blood and show signs of an inflammatory condition.

The lymphatic glands will also be found to be enlarged and show signs of congestion. Before post-mortem, the carcass is usually very much “blown” and distended. This disease affects animals very quickly, and the seizure is fatal. It is highly infectious, and as it is one where stringent regulations must be enforced in connection with it, there are special provisions made thereanent which we will take here.

Anthrax Order, 1910.—The following is a brief summary of this important Order :—

Any person having an animal suffering from or suspected of anthrax shall at once notify the same to a police constable, who shall at once report the matter to the inspector of the Local Authority, and they will notify their medical officer of health.

All fowls and other animals are to be prohibited from gaining

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access to affected animals, and all contact animals to be detained pending an inquiry.

Premises to be disinfected with chloride of lime.

The inspector of the Local Authority must discharge all the duties and serve all notices in connection with this Order. The Local Authority will order an inquiry into the matter by a fully qualified veterinary surgeon.

The inspector of the Local Authority must see to the proper disinfecting of the premises, and see to the disposal of the carcase.

Notices are to be published by the Local Authority fixing infected areas, such areas not to include a market-place, fair ground, sale yard, slaughter-house, etc.

Copies of all notices served must be sent to the Board of Agriculture.

Access of animals to diseased or suspected animals on any part of premises where they are, to be prohibited. Animals not to be allowed to stray out of, or into, any such place, and not to be moved out of an infected area.

Any horse, ass, mule, or dog not diseased may be moved.

Any animal infected or diseased may be moved to the nearest slaughter-house under the supervision of the Local Authority.

All litter, dung, broken fodder, utensils, pens, hurdles, etc., are not to be moved out of an infected area unless with permission of the Local Authority.

As to the disposal of the carcase, the Local Authority may do so either by—

(a) *Burial*.—The carcase should be removed as soon as possible in its skin to a suitable place into which no animal has access, and which is removed from a dwelling-house and from all risks of contaminating any well or water-supply. Here it shall be buried at a depth of not less than six feet below the surface of the earth, and with a layer of lime not less than one foot thick both beneath and above it, or,

(b) *Destruction*.—If the Local Authority have a licence from the Board of Agriculture, they may cause the carcase to be destroyed by heat or chemical agents after it has been taken charge of by an inspector of the Local Authority, to a horse-slaughterer's yard or knackery, or other suitable place for the purpose.

No carcase is to be buried or destroyed except by the Local Authority, or removed from the place where death occurred, or the animal was slaughtered, except for the purpose of burial or destruction by the Local Authority.

Before removal, all the natural openings to the carcase should

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be plugged with tow soaked in pure carbolic acid or other disinfectant. The skin should not be cut, and nothing should be done to cause effusion of blood except by or under the supervision of the veterinary inspector, and so far as is necessary for the purpose of microscopical examination.

Milk from suspected animals not to be used until it has been sterilised or boiled, and all utensils are to be thoroughly cleansed after using.

Premises, vans, pens, etc., to be disinfected as follows :—

1. By thoroughly drenching or soaking with a 4 per cent. solution of carbolic acid.
2. If nature will allow it, it shall be scraped, washed, and scoured.
3. Coated with a 1 per cent. solution of carbolic acid.
4. Sprinkled with linewash.

All scrapings, sweepings, dung, litter, etc., to be burned or disinfected with quicklime.

It is unlawful to expose a suspected animal in a market-place, show yard, etc., or to place an animal in a lair or place used by other animals, or to send or carry it on a canal or railway, or to lead, carry, or drive such an animal along a public highway, or to keep on unenclosed land, or to graze such animals on the side of the public highway.

In addition to the diseases already enumerated, we have the **Foot-and-Mouth Disease** (*Episootic apatha*), a highly infectious trouble affecting cattle chiefly, but sheep and pigs may also contract this malady.

The affected parts are the tongue and lining membrane of the mouth, between the claws of the hoofs, and, in cows, on the udder. Blisters form on these parts, and these afterwards burst and form ulcers. This disease is said to be communicable to man, and where it has affected the udder of a cow it will readily be seen how the matter from the blisters or ulcers may mix with the milk and form a source of danger. As a rule, there is not much constitutional disturbance or alteration in the animal or carcase with this disease.

Actinomycosis, or wooden tongue, is a disease peculiar to oxen, and attacks the tongue and adjacent tissues, including the jaw, while in advanced cases the lungs may be affected. The tongue is highly inflamed and so enlarged that it may protrude from the mouth several inches. The tongue is also hard and dense, and on incision presents a nodular appearance. There are fibrous tumours at the angle of the jaw, and these may also be found in the lungs and peritoneum, while the lymphatic glands may be swollen and œdematous.

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We now come to the parasitic diseases found in animals used as food by man. These we will classify as follows :—

Parasites of the Ox—

Strongylus micrurus.
Actynomycosis.
Liver Fluke.
Cysticercus bovis.
Hydatid Cysts.
Pimply Gut.
Bots or Warbles.

Parasites of the Sheep—

Strongylus filaria.
Strongylus rufescens.
Hydatid Cysts.
Cysticercus tenui collis.
Liver Fluke.
Sheep Scab.

Parasites of the Pig—

Cysticercus cellulosæ.
Trichina spiralis.
Strongylus paradoxus.

Taking these as enumerated, the following is a brief description of their nature :—

Strongylus micrurus affects the trachea and bronchides. In this “site,” the parasites make their abode. These parasites consist of minute wire-worms, and cause the animal trouble when breathing. Unless in very much advanced cases, the animal or carcase will show no appreciable sign of disease. Under the name of **Strongylus filaria**, or more commonly *Husk* or *Hoose*, we have a similar disease in sheep. In both cases the animals will be troubled with a frequent and troublesome cough and the breathing will be hurried.

Liver Flukes, or *Distoma hepaticum*, attacks both oxen and sheep. This disease destroys a large number of sheep annually. The parasite is shaped like a sole, and may measure up to an inch and a quarter in length ; it is found in the bile ducts of the liver, and in advanced cases, pigmentation occurs, when the bile ducts become hard and gritty.

Symptoms of the disease are jaundice, with bile staining, dropsy, and emaciation, and the bile ducts much enlarged.

Hydatid Cysts most frequently affect the liver and lungs of sheep and oxen, and occasionally pigs, but they may also invade the spleen, heart, kidneys, peritoneum, and occasionally the glands.

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They vary in size from a marble to a hen's egg. The outside is a laminated structure containing a non-albuminous fluid. The flesh of such animals shows little effects of the trouble except in very extreme cases.

Cysticercus bovis, which attacks oxen, strongly resembles *Cysticercus cellulosæ*, which is found in pigs. The cysts may be seen between the fibres of the muscles in the muscular system, the popular “ sites ” for them being the tongue, neck, diaphragm, and shoulders, and they may also be found in the kidneys, liver, heart, and sometimes the brain.

These parasites are the larvæ of the human tape-worm. In pigs, the term measles is often applied to cases of this disease, although it has absolutely nothing to do with the infectious disease of that name found in human beings. The cysts may be seen with the naked eye. They are oval in shape and vary in size, and if the disease is of long standing, the cysts will have become chalky, and when the flesh is cut into, a grating sensation will be imparted to the hand. If we remove one of those cysts and place it on a glass slide and examine it under the low power of a microscope, a small depression will be seen at the head of the parasite ; this depression is surrounded by hooklets, six in number. It is by means of these hooklets that the parasite finds its way into the tissues of the animal until it reaches a favourable position, where it becomes encysted. Heat at 170 degrees F. destroys these parasites, so that meat well and thoroughly cooked may be safely consumed, only it would require us to be sure that the heat to that degree had penetrated to all parts of the meat, as it might not do if the cut was a thick one.

Trichinosis, or *Trichina spiralis*, to give it its full title, is a parasitic disease affecting pigs and man. It consists of small thread-like worms within the muscular fibres. These cysts are very small, but when present in large numbers the flesh presents a speckled appearance to the eye. If we cut a thin section of the affected flesh and place it under the low power of a microscope, having previously treated it with a little solution of potash and teased it out with the aid of needles to disintegrate the muscular tissue, we will see the parasite curled up inside its cyst. Unlike the *Cysticercus cellulosæ*, this parasite has no hooklets at its head, but is fitted with a sucker. The favourite “ sites ” for these parasites are in the neighbourhood of the bowels, diaphragm, and abdomen.

Strongylus rufescens is a parasite sometimes found in the lungs of sheep, giving rise to parasitic pseudo-tuberculosis. Here the student has to go warily, as this disease in a way resembles tuberculosis. A large number of whitish nodules, evenly distributed, appear over the cut surface of the affected organs.

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Cysticercus tenui collis is a bladder worm which affects sheep. This bladder worm varies in size from a pea to a large-sized egg. It has a long corrugated shaped neck, at the top of which is the head, which is fitted with a double row of hooklets. Its favourite "sites" are the pleura and peritoneum, and under the serous covering of the internal organs. In cases where the liver is attacked, the cyst will usually be found in the centre of the organ. Unless in cases of long standing, the flesh of such an animal will be in fairly good condition.

Pimply Gut.—In this case, the parasite attaches itself to the outer covering of the intestines of the sheep or ox, and gives it a pimply appearance. In such cases, the gut should be condemned.

Bots or **Warbles** are found both in sheep and oxen. They are caused by a certain type of flies which deposit their eggs on the skin, generally along the back of the animal. As these eggs develop, they often reach the size of a pigeon's egg, and are buried in the skin of the animal; hence pus may be seen emerging from them. These bots may be very numerous, or there may only be a few of them. In sheep, they sometimes invade the nostrils of the animal, when pus may be seen oozing from the nose.

Sheep Scab or **Mange** is a parasitic disease affecting the skin. This disease may also be found in man and domestic animals. It may be found all over the body, but the favourite "sites" are where the wool is short, such as at the head, neck, tail, inside of thighs and belly. The skin beneath the wool is covered with scales and scurf, and crusts form, and frequently scabs, which often turn into raw sores.

The diseases just discussed are those affecting oxen, sheep, and pigs, but as horseflesh is often used for the food of man, it is necessary to deal with two common diseases met with in this direction, namely, Glanders and Farcy.

Glanders.—The favourite "site" of this disease is the mucous membrane of the nostrils. Here, the papules will be found, and in some cases they merge into one another and break down, giving rise to ulcers. The neighbouring glands usually swell, and later become hard and fibrous. There is a discharge from the nostrils which is very contagious. In advanced cases, the lungs will usually be found to be much affected.

Farcy, which is another form of the same disease, is characterised by the appearance of buds or nodules under the skin, usually over the limbs and at the root of the tail. The lymphatic glands may be much enlarged, and the limbs swollen. As the disease advances, the nodules break down, pus is discharged, and ulcers form.

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In connection with these diseases, the Glanders and Farcy Order of 1894 states that every horse, ass, or mule dying of this disease, or which has been slaughtered while suffering from it, shall be seized and destroyed.

The best method of destruction is by burning.

In concluding this chapter, it is necessary to refer to **putrefactive meat**, which may arise from its having been kept too long, or under conditions which set up putrefactive changes quickly.

Putrid meat may give rise to very distressing and sometimes fatal illness. Pork seems to have a tendency to become putrefactive more quickly than beef ; still it may be found in all classes of flesh food, as well as in fish. Putrefaction is caused by the presence in the flesh of minute organisms which cause an organic chemical poisoning. The flesh is softer than normal, and often moist-looking. Its colour may be dark green, or even black, and it has a very disagreeable and offensive odour.

In all cases of putrefaction, the meat should be seized as unfit for the food of man.

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Chapter VII

METHODS OF SLAUGHTERING, INSPECTION OF FOOD AND SLAUGHTER-HOUSES

HAVING considered the diseases affecting animals intended for the food of man, we will now turn our attention to the methods of slaughter of such animals, and the nature of inspection of the carcasses and organs.

In slaughtering animals of the bovine class, the system in most common use is the **Pole-axe Method**. The pole-axe, as shown in Fig. 13, resembles not a little the old-style wood axe.

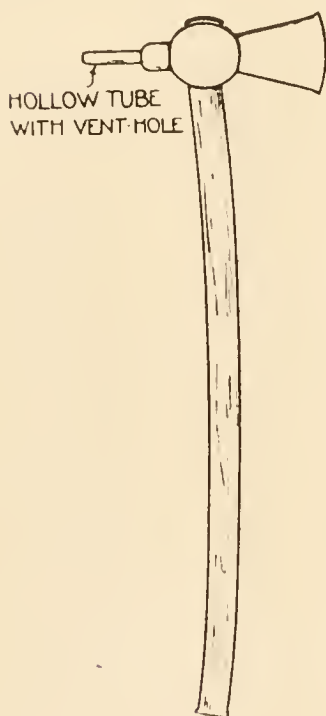


Fig. 13

It is a hammer-shaped instrument, having a pointed striking edge, the other edge being finished similar to an ordinary hatchet. A rope is passed around the neck of the animal to be killed or around its horns. This rope passes through an iron ring in the floor of the killing-booth. When pulled on, the rope pulls the head of the animal down to the ring until the nose almost touches the floor. The butcher then strikes with his pole-axe, aiming at a point which may be arrived at by drawing two diagonal lines from the base of the horns to the eyes. The pointed edge of the pole-axe penetrates the animal's skull, and it falls in a heap on the floor. The pole-axe being withdrawn, the animal is now pithed. This is done by inserting into the hole made by the pole-axe a thin piece of cane which passes right through the brain matter into the medulla oblongata, and in this way stopping the sensation of pain.

Bleeding is next carried out by cutting the vessels in the neck, and the blood collected in metal vessels.

The pole-axe in the hands of a proficient butcher is a very satisfactory method of slaughtering animals, but it must be admitted that in the hands of the unskilful, the operation can be made one of great pain and torture for the animal. To obviate this, leather masks were introduced. This mask covers the fore-

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head and eyes of the animal. Fitted in the centre of the mask is a shield-like iron portion with a metal tube which receives a striking pin or bolt with a pointed end and rounded head. Having adjusted the mask on the animal's head so that the sharp point of the striking pin is against the vulnerable spot, the butcher strikes the bolt with a wooden hammer, causing the sharp point to penetrate the animal's skull. If the animal to be slaughtered is quiet, this system is all right, but should it be restless, there will be a considerable amount of risk to the person attempting to adjust the mask.

Let us now take another method of slaughter known as **Greener's Humane Cattle Killer** (seen in Fig. 14). This

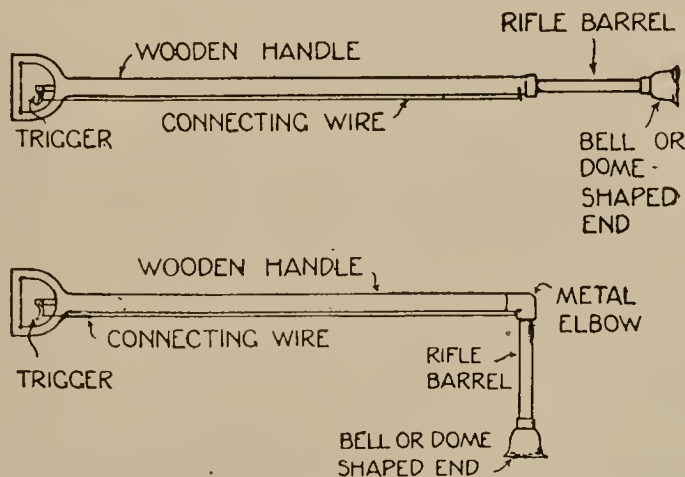


Fig. 14—Two Types of Greener's Humane Killer for using in different positions. No. 1 for use in front of animal, and No. 2 for using from the side.

instrument consists of a short rifled barrel, made to take a small cartridge with a steel-pointed bullet, and finished with a bell-shaped chamber. This chamber serves three useful purposes: first, it deadens the sound; second, it protects the operator from the flash; and, third, it directs the bullet through the brain into the spinal cord. These instruments are made in different styles, so that they may be used when close up to the animal, or at a little distance when in front of it, or from the side.

The Jewish Method of slaughter.—The animal is first thrown on the ground on its side, and fixed so that the head rests on the horns and nose, after which the throat is cut by a very sharp knife, the incision going through all the structures right down to the vertebræ.

Calves, pigs, and sheep are usually killed by cutting the animal's throat by means of a sharp knife which severs the chief blood-vessels in the neck.

At the time of the operation, the butcher gives the head a

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sharp push back, which serves to break the neck and stop convulsive movements. In the case of pigs, stunning by means of a wooden mallet is sometimes resorted to, and in the case of boars of a ferocious nature, the use of Greener's Humane Killer may require to be called in before they are disposed of.

We will now turn our attention to the method or order in which organs are removed from the carcase in the process of dressing. While the dead animal is on the ground, the abdominal cavity is opened and the omentum or caul fat is removed. By means of the overhead tackle, the animal is raised a little from the floor by the hind quarters and the organs removed in the following order: bladder, intestines (including rectum and mesentery), stomach, with spleen attached, liver, lungs with heart, trachea, and œsophagus. In the case of pigs, as soon as they are bled, they are placed over vats and scalded with hot water and scraped. This done, the carcase is then opened and the organs removed.

Once the animal is killed and the carcase dressed, it is run by means of the overhead tackle into the cooling-room and there allowed to hang, all the organs belonging to it being carefully arranged on hooks or on a table beside it for inspection.

In carrying through our inspection, it is well to have a system something after the following fashion:—

1. Note if well fed, emaciated, or discoloured. Outside fat should be light yellow, and free from patches and spots.

2. The carcase should be well set, provided that the animal has been slaughtered a reasonable length of time. This will, of course, depend on the nature of the weather.

3. Examine pleura and peritoneum for evidence of stripping and tubercular deposits; in doing so, lift the diaphragm and examine for any signs of disease.

4. Examine the lymphatic glands of carcase.

5. „ head, tongue, and glands.

6. „ lungs, trachea, heart, and œsophagus.

7. „ liver.

8. „ spleen.

9. „ stomach.

10. „ intestines.

In testing the flesh, the meat should be pressed with the fingers, when there should be no pitting or crackling.

Good meat is neither of a pale pink nor of a deep purple colour. It has a marbled appearance due to the small veins of fat embedded in the muscular tissue. It should be firm and elastic to the touch, and the fat should be well set. It should have little or no odour, and the odour should not be unpleasant.

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The inspector must be prepared for all manner of tricks of the trade. Left to himself, the unscrupulous butcher will carry out some marvellous ideas.

It is very easy, for instance, for a butcher to so dress the fat under the udder of a cow that it will look when cold like the scrotum fat of an ox ; but this in itself does not worry the inspector in the same manner as that in which the butcher may possibly remove abscesses, parasites, and tubercular deposits ; while in some cases he may even remove the pleura or peritoneum and rub over the surface with a piece of fat so that it looks as if it had not been interfered with. This little “dodge,” however, is easily detected by applying a cloth wrung out of hot water over the part, when the torn and rough edges will stand out, and so the ruse will be detected.

For this reason, it is important to give the interior, both of the chest and thoracic cavity, a thorough examination.

The lungs should be spongy and of a bright pink colour, and if a small piece be cut off, it should float in water. The lungs, moreover, should be palpated all over, so that nodules, if present internally, may be detected. The liver should be sufficiently firm not to break down easily on pressure, and should be examined for the presence of abscesses. The stomach and bowels should be free from ulcers and should show no signs of inflammation or patchiness. The spleen should be carefully palpated to ascertain the presence, or otherwise, of nodules.

Using the post-mortem characteristics given in the preceding chapter for the various diseases, the nature of the trouble will readily be recognised.

The inspector may use skewers or piercers, should he wish to test the quality of meat which is deep seated or near the bone, or a knife may be used, pushed into the flesh, and smelt when it is withdrawn, when the nose will detect putrefaction by the smell.

We now come to what class of disease calls for the seizure of the carcase as being unfit for the food of man. Now, the first of these we have already discussed, namely, cattle plague, pleuropneumonia, sheep-pox, cow-pox, influenza, rheumatism, black-quarter, splenic apoplexy, pig typhoid, swine fever, quinsy, anthrax, and glanders or farcy—all come within the category of being condemned entire. In cases of foot-and-mouth disease, in some places the parts affected need only be seized, while in actinomycosis, the parts only affected may be seized, but if the carcase shows signs of emaciation, then one must seize the whole lot. In cases of *Cysticercus bovis* and *cellulosæ*, and in *Trichina spiralis*, we have seen that the cysts are easily destroyed by cooking, provided the cooking is done thoroughly, but as such a proceeding

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cannot be always guaranteed, and as these diseases are communicable to man, it is advisable to condemn such meat.

With regard to the other parasitic diseases, it is quite sufficient, as a rule, to condemn the part affected. In cases of much emaciation, however, the whole carcase should be seized. In cases of bots or warbles and sheep scab, these are removed along with the hide in the skinning process, but should the animal have suffered a good deal, there may be emaciation, or inflammation sufficiently evident to warrant the seizure of the whole carcase.

Dealing now with tuberculosis, we touch a subject which has been the cause of much controversy. It very often happens that the carcase of an animal which has suffered from localised tuberculosis shows lovely meat, and the question is raised as to why it should be condemned. A Royal Commission has given its edict in this matter, and this we will deal with in the next chapter. In the preceding chapter we referred to "localised" and "generalised" tuberculosis; thus, again, we may have the disease confined to one organ or in the vertebræ. Where such is the case, it is the usual practice to seize such organ or that part of the vertebræ affected, together with the flesh adjoining it, and pass the remainder. Should the case be localised, either to the peritoneum or the thoracic cavity, and the remainder of the carcase be good, then the affected half is seized, the other half passed; but if both cavities are affected, or if the whole of the lymphatic glands are diseased, then the whole carcase and organs must be seized.

In the case of pigs, where any lesions of tuberculosis are found, the whole carcase is condemned, there being no question here of localised or generalised tuberculosis the same as in cattle. At first glance one might be pardoned for asking why this should be the case, but it will readily be understood that the seizing of a pig's carcase is not such a serious matter, from a financial point of view, as the seizing of the carcase of an ox, while again it may be pointed out that general tuberculosis in a pig is commoner than in bovines.

As already pointed out, the tubercular lesions or nodules may be confined to the organs, and it is for this reason that the inspector must take great pains in examining these.

In addition to carcasses which may be diseased, there are other matters which require the attention of the inspector. For instance, one may meet with the carcase of a *suffocated animal*. In this case, the carcase shows a reddish, blood-stained appearance. The flesh is dark in colour, sticky to the touch, and will smell more or less offensive. The blood-vessels will contain much congealed blood, and the carcase will be limp, as *rigor mortis* passes off quickly under these circumstances.

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In the case of a carcase where the animal has been *drowned*, the flesh is dark in colour, flabby, full of blood, and smells badly.

When an animal has had to be slaughtered in a *choking condition*, the flesh is pale, soft, wet, and flabby, having a par-boiled appearance, especially in the hind-quarters.

In the case of a carcase of a *smothered pig*, it will usually be found that the flesh is of a dark purple or dark reddish-brown colour, and the flesh separates easily from the bone, while it is soft and sticky to the touch. The serous membranes show a blood-stained appearance, the veins are distended and show plainly and are full of blood. The meat, moreover, sets badly. The organs, especially the liver, lungs, and kidneys, contain large quantities of blood, while the abdominal walls are of a greenish colour.

We now come to the flesh of calves sold as veal. Here, the inspector has to keep a watchful eye, as it were.

Veal should be pale in colour, nearly white, and should be fairly firm and elastic. It smells fresh, and is very moist without being wet. A fresh-cut section has a silky feel. The fat is plentiful, white, and fine, and free from bloodstains. The rib bones should be a pinkish-red colour. Veal may be said to be the flesh of calves two months old. In carrying through his examination, the inspector has to keep a sharp look-out for what is known as *slink veal*—that is, the flesh of a calf which has been born prematurely, or which has died soon after birth, or which for some reason or other has had to be killed within a few hours of being born. A few hints, therefore, will not be out of place here. In dressing a carcase of veal, the skin is usually left on, or at least partly so, by the butcher, while the legs are cut through at the joints and allowed to hang. The inspector should first examine the pads of the hoof. In the case of *slink veal*, these will be found to be very soft, for they do not get hard until the animal is from eight to ten days old, and will show conical processes. Again, one ought to look for the stump of the umbilical cord. Next he should examine the lungs, and as a test he should cut off a small part and drop it in a pail of water. If the animal has lived, and consequently breathed, the small piece of lung will float, whereas if the process of respiration has never taken place, then the cut portion of the lung will sink to the bottom of the pail. After a little experience, this test will be found unnecessary, as one soon recognises a lung which has not inhaled air, while the butcher very often, in cases of this sort, conveniently gets rid of the lungs before inspection takes place. This fact in itself is sufficient to arouse the suspicions of the inspector.

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Two diseases in calves should be looked for by the inspector when examining a carcase.

The first of these is what is known as **White Scour**, which attacks and carries off so many calves in this country. This disease is a form of diarrhœa, and very quickly brings the animal down to a skeleton ; as a consequence, the carcase shows emaciation and very bad condition. The flesh is pale, wet, and flabby. Traces of congestion will be found in various organs, and a white curdy matter may be found in the stomach and intestines. There is no question about condemning such veal.

The second common trouble met with in calves is what is known as **Navel Ill**, which results from improper care of the umbilical cord. Pyæmia may result, and should such be the case, abscesses are found in the liver and various parts of the carcase. The hocks and knees are much swollen, and if these are incised, a yellowish fluid exudes therefrom. Here again there should be no hesitation in condemning such meat.

In cases of bad veal, the flesh will usually be found to be pale grey in colour, flabby, soft, wet, and easily torn or penetrated with the finger. The fat will be scanty, and of a greyish-yellow or reddish colour.

So far, we have not dealt with what is known as **dropsy**. Dropsy, or œdema, is not a disease of itself, but arises from some other disease and gives rise to a swelling which may be general or local, i.e. confined to one part. It is due to a collection of serous fluid in the cellular tissues, and usually arises from some defect in the circulatory system.

Where a carcase very yellow in colour is met with, one may be fairly certain that the case is one of **jaundice**. The bile ducts having become obstructed, the bile secretions have gone to the meat and fat. It must not be forgotten, however, that the fat of Jersey cattle is always of a distinctive yellow colour, while again, if the animal had been heavily fed on oil-cake, that will also, to some extent, have caused a distinct yellow colouring in the fat.

Before leaving this matter, we must also consider the question of **frozen meat**. As is well known, meat is conveyed from the very ends of the earth in order to supply our markets, and this is only possible by the method of freezing meat. Large liners are fitted up with expensive refrigerating plants and rooms, and in all large towns there are large cold storage buildings. By means of these, meat can be kept for a very long period in good condition. Meat, however, when withdrawn from cold storage, should be used up, and not put back again after, say, part of it has been taken away. In freezing, the temperature is kept about 20 degrees F. ;

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this differs from chilled meat, where the temperature is kept about 35 degrees F. Frozen or chilled meat looks fairly well when first taken out of cold storage, but after exposure to the air for a little time it looks very dirty and untidy. The meat is dull, pale in colour and may be soft. The fat is often yellow in colour, has a tallowy smell and taste, and is often stained by meat juices. In the frozen condition, the fat is very often pink in colour. Very often, in testing a frozen carcase, a brace and bit is employed to pierce near the bone, when the part may be smelt.

We will now take one or two butchers' products, and the methods employed to test same.

Sausages are usually made of meat, bread, rice, salt, pepper, and spices enclosed in gut or intestine.

To test them, they should be cut across or lengthways, and smelt ; or place a little of the sausage in a saucer and pour boiling water, to which a little lime-water has been added, to bring out the smell.

Polonies are made of pork, veal, ham, chicken, and tongue, with rice added to mince meat, together with pepper, salt, and other seasonings. These may be tested in a similar way to sausages.

Chitterlings are prepared from the stomach and intestines of pigs.

In testing fresh or salted meat, it is always well to use a wooden skewer.

We will now turn our attention to **fish**. Those may be said to be divided into two classes, namely, those of the ordinary table variety and shellfish. Of the first kind, they may be again classed as, first, white-fleshed fish, i.e. haddock, cod, flounders, brill, plaice, sole, turbot, whiting, etc. ; second, red-fleshed fish, such as salmon and sea trout ; and third, greasy-fleshed, such as mackerel, sprats, herring, pilchards, etc.

Fresh fish are a splendid article of diet, being nutritious and easily digested, although greasy fish, such as salmon, are more difficult to digest, and in many cases are the cause of minor ailments.

Of the second class of fish, namely, shellfish, we have, among others, oysters, whelks, cockles, mussels, prawns, shrimps, lobsters, crabs, etc.

Of diseases of fish, a few which affect the first-named variety are :—

Epibdella.—A flat worm parasite resembling a box leaf ; it is dull white in colour, and is usually found in turbot.

Nematodes, or round worms ; these are usually found in plaice, lemon soles, cod, smelts, mackerel, herrings, etc. The favourite “site” is in the intestine of the abdominal cavity. Smelts are very liable to these thread-worms.

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Cancer.—A swelling on the under jaw, and the gill rays may be affected with small nodules in later stages. The growth affects the floor of mouth and head and neck. This disease, it should be stated, is very rare.

Salmon Disease.—In this disease, bacilli gain access through abrasions, usually on the head, while later whitish patches show on scaleless parts of the body, and these latterly develop into ulcers.

Fresh fish are firm to the touch and solid ; when held by the head between the finger and thumb, as may be done with smaller varieties, they remain rigid.

The flesh adheres firmly to the bones, and the scales and gills are bright. The eyes should be full, and not sunk down in the sockets, and they should be bright and clear. As an indication of *staleness* and *signs of decomposition* in fish, the following points will be noted :—

1. The eyes are dull, and the gills are a dirty brown.
2. The fish smells badly.
3. The flesh pits on pressure, and parts easily from the bone when pressed with the fingers.
4. If placed in water, fresh fish will sink, while stale fish will float.
5. In brill, a bluish colour denotes decomposition.
6. In sole, if soft and sticky, decomposition has set in.
7. In mackerel, there will be redness about the head, and a dull appearance.
8. Herrings give off crackling sounds on pressure by fingers.
9. Eels lose the smooth, slippery feel, go dry and rough, and gases inflate the bellies.

Let us now turn our attention to shellfish, which are divided into two classes, namely, crustaceans and molluscs.

In the first of these classes, we have the lobster, crab, prawn, shrimp, and crayfish, while in the latter class we have the oyster, cockle, whelk, winkle, and mussel.

All shellfish are able to cleanse themselves of impurities or bacilli if subjected to proper treatment, or placed in clean sea water for a certain period.

Oysters will clean themselves in from eleven to eighteen days, mussels in about four days ; but cockles are slower, and for this reason should be cooked by steam under pressure.

Crustaceans are always cooked before being eaten. When moulting, these fish are unwholesome.

Crabs are killed by piercing them between the eyes with a sharp instrument ; otherwise they cast their claws when boiled.

When inspecting crabs, look for discoloration of the apron,

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and feel under the large claws to see if sticky and wet. The joints should be rigid. Again, the faded appearance of a crab is a clear indication of staleness.

Fresh **lobsters** should be of a deep blue colour and have a clear, hard shell. Lobsters are cooked by plunging them alive into boiling water for about twenty minutes. This method of killing and cooking simultaneously is the only one whereby the true characteristic cooked lobster colour can be obtained.

When examining fresh lobsters, the tail when pulled out should spring back sharply.

Shrimps in good condition have the tails turned inwards, pressing firmly against the body, and they are stiff. They have a clean-looking shell, clear prominent eyes, feel crisp, and have a pleasant smell.

Bad shrimps go sticky, are soft, smell unpleasantly, and very often become heated.

Prawns in good order are a bright red in colour, and have long serrated edged sword or horn projecting from the snout. The same methods of inspection apply to them as to shrimps.

Oysters.—The shell of a healthy oyster should be tightly closed ; the least sign of gaping shows that it is lacking in freshness ; if only slightly gaping, it should close on handling. Again, if oysters are fresh, and one attempts opening with a knife, the shell will forcibly close on it.

Floated oysters are those where ice is packed in with the fish, and thus make them adulterated.

Cockles sometimes gape when alive, but they will immediately close on handling.

Apart altogether from the question of staleness in shellfish, one has to remember that these have their “ beds ” at the mouths of rivers, and a certain danger lies in the fact that these beds may be in the direct flow of the sewage from a near-by town.

Should this sewage contain any matter infected with typhoid or enteric germs, it will readily be seen how shellfish from such a bed might be the cause of setting up an epidemic. For this reason, oyster beds are selected with great care so that such a risk is minimised or made impossible.

Poultry.—In examining poultry, the following points should be noted to show their freshness or otherwise :—

The eyes should be bright and prominent, the feet should be limp, moist, and pliable, while the flesh should be neither flabby nor stiff, and the skin should be clean and white.

When stale, poultry will be found to have an unpleasant smell, the flesh will be dark and greenish, flabby, and loose, while

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the skin breaks down easily under pressure. The feet are hard, stiff, and dry.

Old birds may be distinguished by stiff feet, horny and rough legs, strong claws, long spurs, beak firm and hard, and cannot be bent. Moreover, the comb will be rough and thick, and the thighs dark in colour, and hairy; also the breastbone will be hard and unbending, and there will be no down under the wings.

Fowls to be killed should be starved for twenty-four hours in order to allow the crop and intestines to be emptied; otherwise the fowl would show an unsightly appearance due to full crop. The starving also causes the carcase to keep better. The usual method of slaughter is by dislocating the head at its junction with the neck.

Game proves a complex problem at times, owing to the fact that in certain circles of society the carcase is not considered fit for cooking until in a decaying condition.

The inspector will here exercise his own discretion, and will be quite justified in seizing any game which may be offered for sale in an unwholesome condition.

Rabbits suffer from various diseases, the chief one being *Coccidium oviforme*, a disease which attacks the liver and which will be recognised by small, white, roundish foci scattered here and there on the surface of that organ.

In examining rabbits, it will be noted that in fresh samples the flesh has a moist, bluish look, is stiff and firm, and the fat is white and should show good layers around the kidneys. In young rabbits, the ears are very tender and easily torn and bent, the claws are smooth and easily broken, as also is the jaw when pressed between thumb and finger. The knee-joints are large, the neck stumpy, and the nose soft and sharp. In old rabbits, the ears are tough and dry, the haunches thick, and the fur more of a greyish colour.

As attempts of substituting other carcases for rabbits have been carried out, and as many people believe that skinned cats and immature kids may be sold under the name of rabbits or hares by unscrupulous dealers, it will not be out of place here to take a comparison of each, together with the points which lead to the identity of the animal under consideration.

When exposed for sale, a rabbit usually has the head attached, and it will be noted that this is long and narrow with a cleft at lip. There are two incisor teeth close together in each jaw. The rabbit has twelve pairs of ribs, which are not so barrel-shaped as those of a cat. The kidneys are dark brown in colour, and have no superficial veins, while it should be noted that the right kidney

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is nearer to the head than the left. The liver has four lobes. The tail is short and usually attached to the carcase. The fore-quarters are flat, not rounded, and claws straight and blunt. Kidneys are dark chocolate brown in colour, and the ribs are joined under the stomach. Note also that a rabbit is thinner across the loins than a cat.

Should the carcase of a cat be substituted for that of a rabbit, the head is invariably absent. It will be seen, if the head should be left on, that it is shorter and more squat, while there are two large teeth in either jaw on each side, with the space between filled with small teeth. There are also thirteen pairs of ribs in the cat. The kidneys are parallel and pinkish-brown in colour, with veins on surface, and the liver consists of many lobes. The tail, moreover, will probably be removed.

In the immature kid, the head is larger than that of a cat or rabbit, and may show horn stumps. Incisor teeth only may be found in the lower jaw, and eight in number. There are thirteen pairs of ribs, and these are not so barrel-shaped as a rabbit's. The tail will also probably be removed. Moreover, the neck is much longer, and the back-bone raised. Should the feet be left on, they will be cloven and the legs longer. *N.B.*—This is more a case of substitution for hares.

Many rabbits are imported for sale in a frozen condition, and very often when allowed to lie after thawing out a mould sets in. This mould starts with white spots, and in a few days the carcase is quite unfit.

We now come to the question of tinned stuffs. In dealing with these, the inspector should select, say, ten per cent of the consignment for examination. Look out for stained cases which will probably contain a leaking tin or tins; also bulging cases for blown tin or tins.

Take a tin in each hand and strike together on the ends. If sound, they will give a hard metallic sound, but if blown, a drum-like sound will be given. Good tins will be concave top and bottom and look fresh.

Slack packed is a term given to a tin which bulges but is quite sound. In dealing with tinned goods, look out for soldering defects and signs of damage, and note the sound when shaken. Also see if there are rusty spots showing through the labels.

A good method of testing is by dipping the tins for a short time in very hot water, as should the contents be bad, they will give off a putrefactive gas, and the immersion of the tin in very hot water will cause this gas to expand and push out the ends of the tin.

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The question of testing eggs is often raised. Of the many methods in vogue, let us take the following :—

1. **Brine test.**—Two ounces of salt are dissolved in one pint of water. The eggs are placed in the brine, and when good they sink, whilst the bad ones float.

2. **Candling.**—This apparatus consists of a dark box with a strong light inside ; this light is projected through the egg and reflected in a mirror. All eggs showing spots are bad.

3. **Light test** is made by placing the eggs before a strong light, when if good the egg shows clear throughout, while markings or spots denote staleness.

4. **Shaking.**—By shaking, when, if fresh, no sound will be heard, whereas a bad egg gives a wobbly sound.

In dealing with **ham** or **bacon**, it is important to keep in mind that though these may be mouldy, that fact alone does not justify seizure. The mouldiness may be due entirely to dampness in the air, or the pickle or preservative used.

Cheese, which consists of a coagulated casein of milk, with varying proportions of milk fat and salts, presents little difficulties in the way of inspection. Inferior cheese is soft and leathery. Cheese should not be of bad shape nor bulged or distorted.

As one may ask what becomes of meat and other articles seized, we will elucidate this point.

In the case of condemned meat at the slaughter-house, it is cut into pieces and placed in a tank filled with picric acid ; or it may be destroyed by burning or burying. Care, of course, must be exercised to see that it is so disposed of that it will not find its way surreptitiously back to the market.

Slaughter-houses, it will at once be seen, call for special measures in their construction. We cannot, therefore, do better than study the type of building designed for this purpose by Mr. Gavin Paterson, architect, Hamilton, at Bellshill, and erected by the County Council of Lanarkshire, and known as Bellshill Public Slaughter-house. Fig. 15 is a copy of the ground plan of the building, which is erected in brickwork, on a site about two acres in extent and suitably removed from dwelling-houses and public roads ; the whole site being enclosed by sheet galvanised iron palisading about seven feet in height.

The building may be said to be divided into three longitudinally. The first comprises lairage accommodation for the animals about to be slaughtered. From these lairs there are doors opening into a narrow passage which communicates with the killing booths directly opposite. This is a very desirable arrangement, as in most slaughter-houses the lairs communicate direct with the killing booth, the former having a door which opens direct into the latter,

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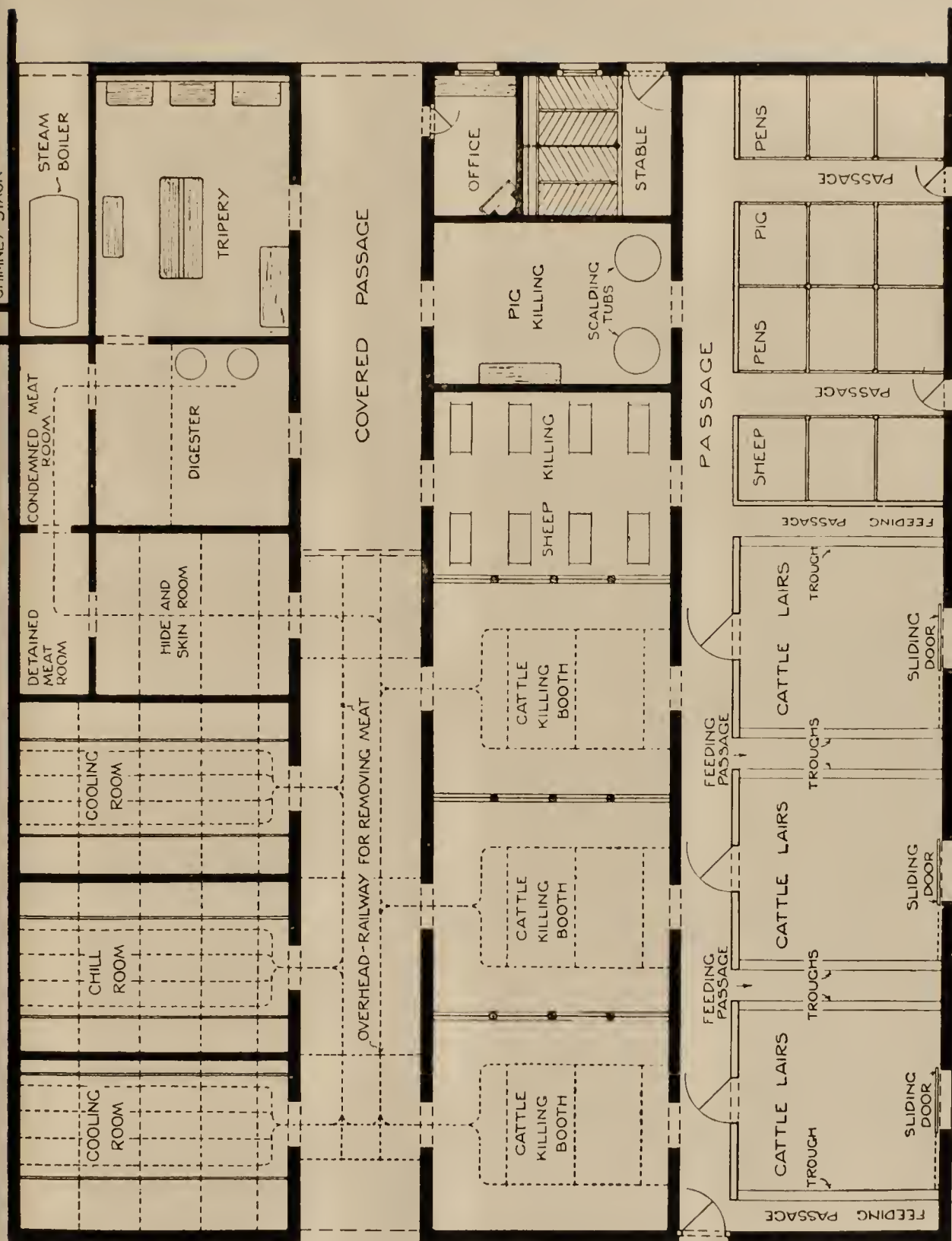


Fig. 15

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and as this door is very often simply a sparred one, the animals in the lairs are often put into a nervous state by the smell of blood from the animals being slaughtered, and, as is well known, the smell of blood highly excites any animal.

In the central building is situated the slaughter-house proper. Here are the killing booths for cattle, sheep, and pigs ; while at one end is the superintendent's office, behind which is a small stable.

The cattle slaughtering hall is divided into three booths or compartments, the walls of which are lined the whole way up with glazed vitrified bricks. The floors are laid with red Dumfriesshire sandstone, embedded in and jointed with cement. The floors are also given a fall to an open channel which runs along the passage outside the hall and discharges into a gully trap. This channel runs the whole length of the building and is trapped between every two doors.

Water-taps, with hose attachments, are fitted in convenient places in the booths.

There are two slaughtering rings, one on each side, while an overhead railway serves to convey the carcasses, when dressed, to any part of the building with ease and expedition.

The three booths are separated from one another by strong iron railings, and in this way the inspector, while in one booth, can keep a watchful eye on what may be taking place in any of the other two.

The pig-killing house is completely shut off from the rest of the building, so that the steam from it may not do injury to other carcasses. This booth is fitted with scalding tanks and a wall hoist.

In the sheep slaughter-house are fitted killing benches and dressing and offal hooks.

These slaughtering booths open on to a covered passage, and this again leads to the third building, which is divided, as will be seen from the plan, into cooling rooms, chill rooms, hide and skin room, detained meat room, condemned meat room, digester, tripery, and boiler-house.

The lighting and ventilation of the buildings is effected by ridge ventilators running the whole length of the roofs.

The upper part of each ventilator is of glass, and of sufficient size to light the departments.

The artificial light is by means of large incandescent gas lamps.

All the drainage is carried to a large depositing tank situate in the grounds ; this tank is periodically emptied by means of a chain pump, and when the sludge is dried, it is used by farmers for manure.

A dung stance is provided, and here all dung from lairs and booths is conveyed and finally disposed of.

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As already stated, a splendid system of overhead railways is in use, which proves very convenient, and is simple to work. One man may, by means of such tackle, convey a carcase to the particular part of the building required.

Such, then, is a brief description of Bellshill Public Slaughter-house, which embodies most of the requirements laid down for slaughter-houses ; and it is because of this fact that it has been introduced here, so that the student may get a good grip of what is really required in this direction.

In many rural slaughter-houses, one finds a primitive state of affairs. Very often the lairage accommodation is of the worst description, while even the killing booth leaves much to be desired.

With a view to guiding the student and showing what is required in a slaughter-house, let us look at the *Model Byelaws as to Slaughter-houses*, issued by the Local Government Board. In passing, it is well to note that in dealing with applications for licences for slaughter-houses, Sanitary Authorities should keep the recommendations here laid down before them to influence their decision in such applications.

The byelaws are as follows :—

1. The premises to be erected or to be used and occupied as a slaughter-house, should not be within 100 feet of any dwelling-house, and the site should be such as to admit of free ventilation by direct communication with the external air on two sides at least of the slaughter-house.

2. Lairs for cattle in connection with the slaughter-houses should not be within 100 feet of a dwelling-house.

3. The slaughter-house should not in any part be below the surface of the adjoining ground.

4. The approach to the slaughter-house should not be on an incline of more than 1 in 4, and should not be through any dwelling-house or shop.

5. No room or loft should be constructed over the slaughter-house.

6. The slaughter-house should be provided with an adequate tank, or other proper receptacle for water, so placed that the bottom shall not be less than six feet above the level of the floor of the slaughter-house.

7. The slaughter-house should be provided with means of thorough ventilation.

8. The slaughter-house should be well paved with asphalt or concrete, and laid with proper slope and channel towards a gully which should be properly trapped and covered with a grating, the bars of which should not be more than three-eighths of an inch

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apart. Provision for the effectual drainage of the slaughter-house should also be made.

9. The surface of the walls in the interior of the slaughter-house should be covered with a hard, smooth, impervious material to a sufficient height.

10. No water-closet, privy, or cesspool should be constructed within the slaughter-house, and there should be no direct communication between the slaughter-house and any stable, water-closet, privy, or cesspool.

11. Every lair for cattle in connection with the slaughter-house should be properly paved, drained, and ventilated, and no habitable room should be constructed over any lair.

In rural districts, one finds here and there private slaughter-houses. While these are undoubtedly under inspection by the officers of the Local Authority, they are, as a rule, so scattered, that though certain days or hours are set aside for examination of animals and carcasses therein, these places leave much to be desired in the way of general efficiency.

In some towns, what is known as the **Clearing-House System** is in operation. Under this method, the Local Authority erect and maintain one large slaughter-house, with all the necessary adjuncts thereto. All animals within the district have to be killed at this slaughter-house, and all animals or carcasses or meat coming from without the district must pass through this clearing-house before being allowed to pass to the shops for sale. No private slaughter-houses are allowed within the district, and it is an offence to kill any animal, unless under emergency conditions, anywhere outside the public slaughter-house. Under this system, all animals have to be sent to the Central Public Slaughter-house, where they are killed under the supervision of an inspector, while all meat entering the district has to pass through the clearing-house, thus resulting in the maximum of benefit with the minimum of trouble.

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Chapter VIII

LAW RELATING TO UNSOUND FOOD AND FOOD INSPECTION

WE will now turn our attention to a study of the powers which are vested in Local Authorities and their officers with regard to unsound food and food inspection.

By *Section 116* of the **Public Health Act, 1875**, we get the following authority :—

“ Any medical officer of health or inspector of nuisances may at all reasonable times inspect and examine any animal, carcase, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, flour, or milk exposed for sale, or deposited in any place for the purpose of sale, or of preparation for sale and intended for the food of man ; the proof that the same was not exposed or deposited for such purpose, or was not intended for the food of man, resting with the party charged, and if such animal, carcase, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, flour, or milk appears to such medical officer or inspector to be diseased or unsound or unwholesome or unfit for the food of man, he may seize and carry away the same himself or by an assistant in order to have the same dealt with by a Justice.”

This Section is extended and amended by *Section 28, sub-section 1*, of the **Public Health Acts Amendment Act, 1890**, which is as follows :—

“ Section one hundred and sixteen to one hundred and nineteen of the **Public Health Act, 1875** (relating to unsound meat), shall extend and apply to all articles intended for the food of man, sold or exposed for sale, or deposited in any place for the purpose of sale, or of preparation for sale within the district of the Local Authority.”

From these Sections it will be seen that medical officers as well as inspectors of nuisances may at all reasonable times inspect any article intended for the food of man. No warrant is required for entry, and “ reasonable time ” will depend upon the circumstances of the individual case. Should the officer come across any article in connection with which he is satisfied that it is unsound, unwholesome, or unfit for the food of man, he is empowered to

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seize it, and have it removed, and take steps to have such article dealt with by a Justice as follows :—

“ *Section 117.*—If it appears to the Justice that any animal, carcase, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, flour, or milk so seized is diseased or unsound or unwholesome, or unfit for the food of man, he shall condemn the same, and order it to be destroyed or so disposed of as to prevent it from being exposed for sale or used for the food of man ; and the person to whom the same belongs or did belong at the time of exposure for sale, or in whose possession, or on whose premises the same was found, shall be liable to a penalty not exceeding twenty pounds for every animal, carcase, or fish or piece of meat, flesh, or fish, or any poultry or game, or for any parcel of fruit, vegetables, corn, bread, or flour, or for the milk so condemned, or, at the discretion of the Justice, without the infliction of a fine, to imprisonment for a term of not more than three months.

“ The Justice who, under this Section is empowered to convict the offender, may be either the Justice who may have ordered the article to be disposed of or destroyed, or any other Justice having jurisdiction in the place.”

This Section is also amended by the second part of Section 28, Public Health Acts Amendment Act, 1890, which reads :—

“ (2) A Justice may condemn any such article, and order it to be destroyed or disposed of, as mentioned in Section one hundred and seventeen of the Public Health Act, 1875, if satisfied, on complaint being made to him, that such article is diseased, unsound, unwholesome, or unfit for the food of man, although the same has not been seized as mentioned in Section one hundred and sixteen of the said Act.”

From these two Sections, the action to be taken by the person seizing any article of food is made clear, while the amending Section disposes of any question as to the mode of seizure.

Should any person obstruct any officer in carrying out his duties in connection with the foregoing Sections, such person shall be liable to a fine not exceeding £5 under *Section 118*.

When any medical officer of health, or inspector of nuisances, has reason to believe that there is on any building or part thereof, any animal, carcase, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, flour, or milk intended for the sale for food of man, which is diseased, unsound, unwholesome, or unfit for food, and if such officer make complaint on oath before a Justice, such Justice may grant a warrant to such officer to examine, seize, and carry away such articles ; and, further, according to this *Section 119*, any person who obstructs such

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officer in the execution of his duty in this direction shall be liable to a penalty.

Passing now to *Section 166* of this Act, we find the legal authority—e.g. Urban Authorities—may provide markets, while by *Section 169*, any Urban Authority may, if they think fit, provide slaughter-houses, and shall make byelaws with respect to the management, and charges for use of same, and for this purpose this Section specifically states that the provisions of the Towns Improvement Clauses Act, 1847, with respect to slaughter-houses shall be incorporated with this Act.

Section 170 deals with the licensing or registration of any slaughter-house, and provides that the owner or occupier so licensed or registered, shall within one month cause to be affixed in some conspicuous part of the slaughter-house a notice with the words printed thereon “ Licensed Slaughter-house,” or “ Registered Slaughter-house,” as the case may be.

Where the Public Health Acts Amendment Act, 1890, has been adopted, *Section 29* stipulates that “ licenses granted after the adoption of this part of this Act for the use and occupation of places as slaughter-houses shall be in force for such time or times, only not being less than twelve months, as the Urban Authority shall think fit to specify in such licences.”

Section 30 of the Amendment Act of 1890 makes it compulsory for notice to be given to the Local Authority of any change of occupation of a slaughter-house.

Should the occupier of a licensed slaughter-house be convicted of selling, exposing for sale, or having in his possession or on his premises any carcase or piece of meat or flesh diseased or unsound or unwholesome, or unfit for the food of man, the court may revoke his licence under *Section 31*.

We will now turn our attention to the provisions of the **Public Health (Regulations as to Food) Act, 1907**, of which the following is a complete summary :—

Object.—To provide for the examination and taking of samples of any article of food which is imported, stored, prepared, or distributed for food or drink (other than drugs or water), to detect whether such are unsound, unwholesome, or unfit for human food, and which form part of a cargo of a ship and are landed in this country as a place of destination or distribution to other centres.

Inspection.—This shall be carried out by the medical officer of health or other person appointed for the purpose by the Local Authority.

Examination.—This should take place in the district, or on board the ship, either before landing or after delivery overside. All persons connected with the ship are to give every facility.

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In special cases the medical officer, or other officer, may apply to a Justice for a warrant.

Samples.—Powers are given for the taking of samples, and in doing so, the consent of the officers of customs is required in certain cases.

Seizure.—When satisfied that an article is unsound, unwholesome, or unfit for food of man, the medical officer, or other officer, may, first, seize and carry the same away to have the same dealt with by a Justice, or; second, give notice to the importer or person in charge that such article is not to be removed from a place specified in the notice without permission.

(*N.B.*—Importer may with permission of medical officer or other officer remove article for destruction.)

Justice may order the destruction of article seized, but if satisfied that the meat is not intended for food of man, he may dismiss the complaint.

The Sanitary Authority must keep a record of all articles destroyed or disposed of in pursuance of these regulations for each twelve months.

Another measure similar to the one just discussed, but dealing with imported foreign meat, is that of the **Public Health (Foreign Meat) Regulations, 1908**, of which the following is a summary :—

Object.—To deal with all imported meats from foreign ports, whether fresh, frozen, or preserved. These are divided into four classes, viz. :—

Class 1 consists of scraps, trimmings, or other pieces of such shape or in such condition as to afford insufficient means of identification with definite parts of the carcase.

(*N.B.*—This does not include ox cheeks, skirts, tails, kidneys, livers, sweetbreads, plucks, hearts, and definite cuts of pork imported in a box or case with official certificate attached.)

Class 2.—Frozen carcasses of pigs without head and its natural attachment, and without glands about throat or other parts of the carcase.

Class 3.—Parts of carcase of pig (which have not been salted, cured, pickled, dried, or smoked) contained in box or case with official certificate attached.

Class 4.—Unclassed meat not described in Classes 1, 2, and 3. Meat under Classes 1 and 2 are not admissible unless the importer exports at his own expense, or furnishes proof that it is not intended for human consumption.

Inspection.—The same methods of inspection obtain here as in the Regulations of Food just discussed.

Procedure.—Officer of customs to notify and detain vessel with any such articles aboard. Medical officer of health may

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give certificate either for exportation or removal of such articles. On certificate that meat is of Classes 1 or 2 or 3 or 4, which is diseased, unsound, unwholesome, or unfit for the food of man, the Sanitary Authority shall, within twelve hours, give notice in writing to the importer stating that unless he gives a written undertaking to export the meat at his own expense, or that it is not intended for human food, they will cause the meat to be destroyed under the direction of the medical officer of health.

If the importer gives such an undertaking, and does not export within three days, the Sanitary Authority shall remove and destroy the articles in question.

If the importer gives an undertaking that the meat is not intended for human food, the Sanitary Authority shall take steps to place the matter before a Justice within twelve hours.

A record of all such cases must be kept by the Sanitary Authority.

Let us now turn our attention to law relating to unsound food as it applies to *Scotland* ; this we find in *Section 43* of the Public Health (Scotland) Act, 1897, where it is stated :—

“ 43. (1) Any medical officer or sanitary inspector, or any veterinary surgeon approved for the purposes of this section by the Local Authority, may at all reasonable times enter any premises within the district of the Local Authority, or search any cart or vehicle, or any barrow, basket, sack, bag, or parcel, in order to inspect or examine, and may inspect and examine

(a) Any animal, alive or dead, intended for the food of man which is exposed for sale, or deposited in any place, or is in course of transmission for the purpose of sale or of preparation for sale, and

(b) Any article, whether solid or liquid, intended for the food of man, and sold or exposed for sale, or deposited in any place or in course of transmission for the purpose of sale or of preparation for sale,

the proof that the same was not exposed or deposited, or in course of transmission for any such purpose, or was not intended for the food of man, resting with the person charged ; and if such animal or article appears to such medical officer, or sanitary inspector, or veterinary surgeon, to be diseased, or unsound, or unfit for the food of man, he may seize and carry away the same himself or by an assistant, in order to have the same dealt with summarily by the Sheriff, Magistrate, or Justice.

“ Provided that in the case of any proceeding under this section with regard to a living animal, the medical officer or sanitary inspector, unless he is himself a qualified veterinary surgeon, shall be accompanied by a veterinary surgeon approved as aforesaid.

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“The police force of each police area shall have power to search carts or vehicles, or barrows, baskets, sacks, bags, or parcels, and to assist generally in executing and enforcing this section.”

It will be seen that the wording of this section is considerably different from that of Section 116 in the English Public Health Act of 1875, but the powers are practically synonymous in both cases. There is, however, one very important point worth noting. In the section we have under review, it will be noted that a veterinary surgeon is included as one who may be appointed to discharge the duties of the section. Presumably this is introduced for dealing with live animals, although his assistance may be requisitioned in dealing with carcasses.

It will also be noted that police officers are entitled to exercise the power of searching without a warrant and to assist generally in carrying out the duties under this section. We will now pass to Subsection 2 of this section :—

“(2) If it appears to the Sheriff, Magistrate, or Justice, that any animal or article which has been seized, or is liable to be seized, under this section, is diseased or unsound or unfit for the food of man, he shall condemn the same, and order it to be destroyed or so disposed of as to prevent it from being exposed for sale or used for the food of man ; and the person to whom the same belongs or did belong at the time of sale or exposure for sale, or deposit or transmission for the purposes of sale, or of preparation for sale, or in whose possession or on whose premises the same was found, shall be liable to a penalty not exceeding fifty pounds for every animal or article, or if the article consists of fruit, vegetables, corn, bread, or flour, for every parcel thereof condemned, unless he proves that he and the person acting on his behalf (if any) did not know, and could not with reasonable care have known, that it was in such condition, or where the proceedings are before a Sheriff, at the discretion of the court, if it finds that he has knowingly and wilfully committed the offence, he shall be liable without the infliction of a penalty, to imprisonment for a term of not more than three months, with or without hard labour, and also to pay all expenses caused by the seizure, detention, or disposal thereof.

“Provided that if such person proves that the animal or part thereof condemned as aforesaid, was within a reasonable time prior to the seizure thereof examined upon the premises where the animal was slaughtered and passed by a veterinary surgeon approved as aforesaid, called in for the purpose, and who shall have granted a certificate of passing as nearly as may be in the next subsection provided, or by a veterinary surgeon in terms of that subsection, he shall be exempt from penalty or imprisonment under this section for such offence.”

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In connection with the foregoing, it is competent to apply for a warrant to destroy a carcass without prosecuting the party to whom it belongs, while it would appear that an animal, carcass, or article, may be condemned without giving notice of such action to be taken to the owner.

The latter part of the subsection deals with the passing previous to seizure of the animal or carcass by a veterinary surgeon, and, as will be seen, this is dealt with more fully in the next subsection.

“ (3) Each Local Authority, or two or more Local Authorities in combination, may, if they think fit, appoint a place or places within its district or districts and fix a time or times at which a veterinary surgeon, approved as aforesaid, shall attend for the purpose of examining any animal alive or dead which may there be submitted to him, and passing or condemning the same, and such veterinary surgeon shall, on receipt of a fee to be fixed by the Local Authority or Authorities and paid by the owner, examine and pass or condemn in whole or in part any animal or carcass so submitted to him ; and if he shall pass the same, he shall grant a certificate of passing which shall set forth the name of the owner, the date and hour of examination, and such particulars regarding the animal or carcass as the Local Authority or Authorities may prescribe for the purposes of aiding in the subsequent identification of the same ; and if he shall condemn the animal or carcass, or part thereof, the animal or carcass or part so condemned shall be retained and be forthwith destroyed by the Local Authority or Authorities, or so disposed of as to prevent it from being exposed for sale or used for the food of man, and the owner shall be entitled to the net price realised from the residual product of the carcass or part so condemned, if any, after deducting the expenses of condemnation and destruction.

“ Provided that no carcass shall be submitted for examination, either under this or the immediately preceding subsection, unless as a whole carcass, including the thoracic and abdominal viscera, in such manner that the examiner shall be readily able to satisfy himself that the organs are those of the carcass under inspection.”

This subsection is obviously framed to assist and protect the honest dealer from any consequences that might arise should he unwittingly be in possession of an animal or carcass he had no reason to believe to be other than sound.

“ (4) Where it is shown that any animal or article liable to be seized under this section and found in the possession of any person was purchased by him or consigned to him from another person for the food of man, and when so purchased or consigned was in such condition as to be liable to be seized and condemned

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under this section, the person who so sold or consigned the same shall be liable to be brought to trial in the district in which such animal or article was seized, and on conviction shall be liable to the penalty and imprisonment aforementioned, unless he proves that, at the time he sold or consigned the said animal or article, he and the person acting on his behalf, if any, did not know, and could not with reasonable care have known, that it was in such a condition."

The intention of this subsection is to enable proceedings to be taken against the original dealer who sold the animal, carcase, or article.

By Subsection 5, the veterinary surgeon who examines an animal or carcase and grants a certificate shall send a copy of the certificate to the chief constable of the district where the examination took place. The principal certificate will be transmitted by the owner along with the animal or carcase to the place of sale, and the person selling will send the certificate to the chief constable of the district where the sale took place. This must be done immediately after the sale, and, within seven days of the date of such certificate.

Under Subsection 6, where a person has been convicted twice within twelve months under this section, the Sheriff, Magistrate, or Justice may, if he thinks fit, order that a notice of the facts be affixed in such form or in such manner, and for such period not exceeding twenty-one days, to any premises occupied by the person, and such person shall pay the costs of affixing. This is in addition to the penalty or imprisonment which may have followed the second conviction. Should such person obstruct the affixing of such notice, or remove, deface, or conceal such notice, he shall be liable to a penalty not exceeding five pounds.

Subsection 7 gives the Sheriff, Magistrate, or Justice power to cancel the licence for a slaughter-house held by the occupier of a licensed slaughter-house convicted of an offence under this section.

Subsection 8 imposes a penalty on any person obstructing any officer in the performance of his duty under this section, while by Subsection 9 a Sheriff, Magistrate, or Justice may deal with an offender whether he has or has not acted in ordering the animal or article to be destroyed or disposed of.

On going back to *Section 33* of this Act, we find the following laid down :—

"33. (1) A person carrying on the business of a slaughterer of cattle or horses, or knacker, shall not use any premises as a slaughter-house or knacker's yard without a licence from the Local Authority, and if he does, he shall for each offence be liable to a

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penalty not exceeding five pounds ; and the fact that cattle or horses have been taken into unlicensed premises shall be *prima facie* evidence that an offence under this section has been committed.

“(2) A licence under this section shall expire on such day in every year as the Local Authority fix, and when a licence is first granted, shall expire on the day so fixed which secondly occurs after the grant of the licence ; and a fee not exceeding five shillings may be charged for the licence or any renewal thereof.

“(3) Not less than twenty-one days before a new licence for any premises is granted under this section, notice of the intention to apply for it shall be advertised by the Local Authority of the district in which the premises are situate, and any person interested may show cause against the grant or renewal of the licence.”

By Subsection 4, any objection to be entertained against a licence must be lodged seven days previous to the meeting, and a copy of the objection must be sent to the applicant for the licence.

“(6) The Local Authority shall have right to enter any slaughter-house or knacker’s yard at any hour by day, or at any hour when business is in progress or is usually carried on therein, for the purpose of examining, whether there is any contravention therein of this Act or of any byelaw made thereunder.”

Under Subsection 7, any person who has been refused a licence by the Local Authority may appeal to the Local Government Board, whose decision shall be final.

“Section 34.—The Local Authority of any district other than a burgh may provide, establish, improve, or extend and maintain, within or without their district, and two or more such Local Authorities may combine to so provide, establish, improve, or extend and maintain, fit shambles or slaughter-houses for the purpose of slaughtering cattle, and for that purpose may borrow such sums of money as they shall find necessary on the security of the public health general assessment and of the rates to be taken and for the use of such shambles or slaughter-houses and ground on which the same are erected, or on any one or more thereof ; and the provisions of Section one hundred and forty-one of this Act shall, with the necessary modifications, apply to such borrowing.”

In Chapter VII of this work, when discussing the disease of tuberculosis, we made reference to a Report issued by a Royal Commission which was presented in 1898, and on its recommendations the Local Government Board have issued a memorandum of instructions.

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The Royal Commission on Tuberculosis put forward the following recommendation for the guidance of the Local Government Board :—

“(a) When there is miliary tuberculosis of both lungs,	} The entire carcase and all the organs may be seized.
“(b) When tuberculous lesions are present on the pleura and peritoneum,	
“(c) When tuberculous lesions are present in the muscular system, or in the lymphatic glands embedded in or between the muscles,	
“(d) When tuberculous lesions exist in any part of an emaciated carcase,	
“(a) When the lesions are confined to the lungs and the thoracic lymphatic glands,	} The carcase, if otherwise healthy, shall not be condemned, but every part of it containing tuberculous lesions shall be seized.
“(b) When the lesions are confined to the liver,	
“(c) When the lesions are confined to the pharyngeal lymphatic glands,	
“(d) When the lesions are confined to any combination of the foregoing, but are collectively small in extent,	

“In view of the greater tendency to generalisation of tuberculosis in the pig, we consider that the presence of tubercular deposit in any degree should involve seizure of the whole carcase and of the organs.

“In respect of foreign dead meat, seizure shall ensue in every case where the pleura have been ‘stripped.’

“*April 4th, 1898.*”

As has been stated, horse-flesh may be used for the food of man, but it can only be offered for sale under certain conditions, and these are contained in the **Sale of Horse-flesh Act, 1889**, of which the following are the main provisions :—

“*Section 1.*—No person shall sell, offer, expose, or keep for sale any horse-flesh for human food, elsewhere than in a shop, stall, or place over or upon which there shall be at all times painted, posted, or placed in legible characters of not less than four inches in length, and in a conspicuous position, and so as to be visible throughout the whole time, whether by day or night, during which such horse-flesh is being offered or exposed for sale, words indicating that horse-flesh is sold there.

“*Section 2.*—No person shall supply horse-flesh for human

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food to any purchaser who has asked to be supplied with some meat other than horse-flesh, or with some compound article of food which is not ordinarily made of horse-flesh.”

Section 3 gives powers to any medical officer, sanitary inspector, or other officer appointed by the Sanitary Authority, to examine and seize any meat which he suspects may be horse-flesh, and which is deposited in any place other than a horse-flesh shop, and carry it before a magistrate, who may order as to its disposal as he thinks fit.

Section 4.—A Justice may grant a warrant to any medical officer, sanitary inspector, or other officer of a Sanitary Authority, if such officer make complaint on oath before such Justice, to enter any building other than a horse-flesh shop, in which such officer has reason to believe that there is kept or concealed any horse-flesh, and to seize and carry it before a Justice to be dealt with.

Section 5 gives powers to the Justice to dispose of such horse-flesh as he sees fit.

Section 6 fixes the onus of proving that horse-flesh is not intended for human food on the person charged, and fixes a penalty of £20 for each offence of contravening this Act.

Section 7 gives the definition of horse-flesh, which is as follows :—

“ Horse-flesh includes the flesh of asses and mules, and shall mean horse-flesh cooked or uncooked, alone or accompanied by or mixed with any other substance.”

The definition of slaughter-house is found in *Section 4* of the Public Health Act, 1875, viz. :—

“ *Slaughter-house* includes the buildings and places commonly called slaughter-houses and knackers’ yards, and any building or place used for slaughtering cattle, horses, or animals of any description for sale.”

In Scots Law, this definition is contained in *Section 3* of the Public Health (Scotland) Act, 1897, which reads :—

“ The expression ‘ slaughterer ’ of cattle or horses means a person whose business it is to kill any description of cattle or horses, asses or mules, for the purpose of the flesh being used as butcher meat ; and the expression ‘ slaughter-house ’ means any building or place used for the purpose of such business.”

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Chapter IX

DAIRIES, COW-SHEDS AND MILK-SHOPS, STABLES AND PIGGERIES

MILK forms a very large part of the food-supply of the people, and no article requires more careful supervision in its production, storage, and distribution than does milk.

As is well known, if proper precautions are not taken, milk forms a very ready vehicle for the conveyance of certain infectious diseases, and also infantile troubles and general disorders.

At one time very little attention was paid to the conditions under which cows producing milk were kept, or the method of storage employed, but happily the connection between health and milk has awakened an interest which has done, and is doing, much to improve our milk supplies.

Milk supplied in our large towns and cities may be said to be derived from three sources, viz. :—

1. From dairy farms situated within reasonable distance of the towns, although outwith the burgh boundary ;
2. From farmers whose premises are far removed from the towns they supply, and who send their milk usually by rail, which is then sold in the town by milk purveyors ;
3. From dairymen and cowfeeders whose premises are within the burgh boundaries.

Originally, the powers relating to dairies were vested in the Privy Council, but by Section 9 of the Contagious Diseases (Animals) Act, 1886, these powers were conveyed to the Local Government Board.

The **Board of Agriculture and Fisheries**, under date September 1911, has issued a circular (No. 24) relative to the construction of cow-houses, which as a guide to the construction of such premises is worthy of our fullest study, and is as follows :—

“ THE CONSTRUCTION OF COW-HOUSES

“ The first requirement in the production of milk for human consumption is cleanliness, therefore one of the most important factors in securing clean milk must be a well-constructed cow-shed.

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“ It is comparatively easy to provide new buildings which will meet all the requirements at a moderate cost, but it is much more difficult to alter an existing building so that it can be made as suitable as a new one. This fact, however, should not deter owners and occupiers from making alterations on the lines suggested, as even the most unsatisfactory buildings can often be much improved without great expense.

“ In designing a cow-house, the principal details which should receive consideration are the following :—

Site, including aspect and arrangement with regard to other buildings ;

General construction of the building, including the walls, roof, floor, drainage, and water supply ;

Internal design, including the arrangement of stalls, stall divisions, feeding-troughs, manure and urine channels, and passages ;

Air space, including floor space ;

Ventilation, including the various methods by which this is attained ; and

Lighting.

“ THE SITE

“ Where there is the opportunity of selection, the site should be moderately high and dry, and the building should be conveniently placed for the supply of fodder and roots, the preparation and storage of feeding-stuffs, and the removal of the manure and urine. There should be easy and ample access to the nearest pasture without interference with other stock, and without affording the cattle an opportunity to stray. In designing new farm buildings, these points can be taken into consideration, but when existing buildings are being altered, great difficulties may occur. With care and skill, however, the average building of the present day may be considerably improved. While shelter from strong winds is desirable, no cow-house should have any buildings, such as hay or straw sheds, or buildings for other kinds of stock, erected against the side walls, though there is little objection to an open-fronted shelter for implements. Land is not so costly around the average farm as to give one an excuse for crowding buildings together.

“ GENERAL CONSTRUCTION

“ *Walls*.—The walls may be of any material which is plentiful and cheap in the district, and with suitable precautions equally good buildings may be erected of stone, brick, concrete, wood, or wood and iron.

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“ If of stone or brick, all outside walls should be neatly pointed, and inside ones plastered or faced with enamelled or hard-pressed bricks. When plastering is adopted, cement should be used for a height of six feet from the floor. Above that the surface should be smooth, and of such a nature that it can be washed or limewashed. If the building is of wood, or wood and iron, all uprights and sills should be of creosoted timber ; the extra expense will not be great, while the life of the building will be at least doubled.

“ *Roof.*—While many kinds of roofing material may be adopted, a wooden roof covered with slates or tiles should be given the preference, and in every case in this country the building should be open to the ridge.

“ *Floor.*—The first point which should be considered in connection with the floor is its level compared with the existing roadway, or completed surface round the building.

“ In many cases, particularly on level land, or where there is difficulty in getting sufficient fall for the drains, the floors are laid at too low a level, with the result that the floor and stalls are often damp, and the roadway outside is covered with mud and slush. In not a few instances, the roadway outside is difficult to improve, as it cannot be raised, owing to the risk of running the surface water into the building, instead of away from it.

“ Such conditions should be guarded against by laying the floor at a comparatively high level rather than a low one.

“ The main flooring material should be either cement concrete or blue bricks. Where clean sharp sand and gravel are available, good cement concrete, properly laid and finished, is probably the best material for general purposes. If suitable sand is not easily obtained, and hard blue bricks can be had at a moderate cost, they may be used in preference to cement concrete. In putting down the floor, either for cement concrete or bricks, the bottom should be laid with stones, six to eight inches deep. These should be sufficiently large to fill up the whole depth in one layer, each stone being separately placed in position by hand.

“ A layer of ordinary concrete three to four inches thick should be placed on the top and well beaten down among the bottoming by hand beaters. Before the concrete has set, it should be covered with one or two inches of a mixture of two parts of crushed granite and one part of cement.

“ This should be left rough, as when smooth the floor is apt to be slippery, unless well washed. It is generally recommended that the passages and hind part of the stalls should be V-grooved, but this has little effect in preventing slipping where the passages are not kept thoroughly clean, while the wheels of coolers or trucks

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used in the conveyance of food to the stock invariably break the surface at the grooves. Properly finished concrete is scarcely ever slippery if clean, but may be more or less so if dirty. It is as cheap as any other flooring material laid equally substantially, is less absorbent than most, and is used for the passages and stalls. Cement might, with advantage, be put in the bottom of the manure channel, so that there are no junctions to hold urine, while the uniform gradient necessary for this part is more easily maintained with cement than with bricks.

"*Drainage.*—There should be no covered drains inside the cow-house. The drainage pipe should be six inches in diameter, with a steep gradient, say, one inch or more in three feet. There should be no bends in the line of piping, which should end in a small cesspool at some little distance from the building. The entrance at the manure gutter should be protected by a grating and any good pattern of sludge collector.

"The drainage outside the cow-house will largely depend on the disposal of the urine; urine drains are always difficult to keep clear, and in consequence they should be as short as possible and be given a good fall. Pipes with loose covers should be inserted at frequent intervals.

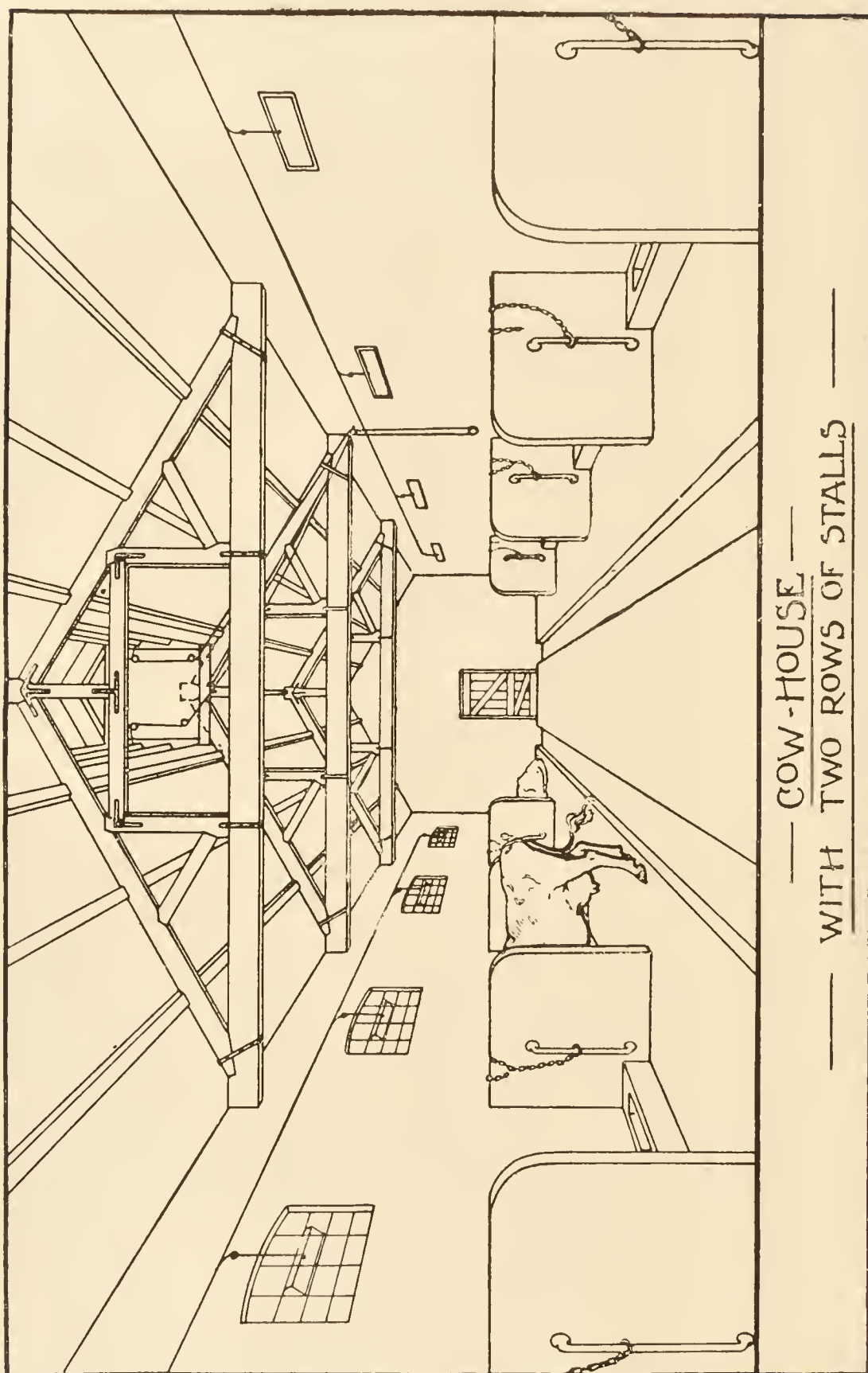
"A good plan is to have a tank close to the dungstead into which all leakage from the latter should run, and into which the drain from the cow-house should discharge. A urine tank in such a position permits of the contents being distributed over the top of the manure heap, though it is best to apply it direct to the land, especially to permanent hay meadows. The best results will be obtained, and less labour will be required, if the urine can be diluted with water, and spread over the land by small irrigation channels.

"*Water Supply.*—The best water supply is that obtained by gravitation from some perennial spring at a higher level, after which come supplies from streams or deep lakes. In many cases springs and rivers at a lower level can be utilised, and part of their contents conveyed to the farm by a ram or windmill. These sources are only available for a limited area of the country, and the average farm has to depend on well water. In such circumstances, a sufficient supply should be provided in storage tanks at such a height as will permit of it being distributed to the cow-house and milk-cooler.

"INTERNAL DESIGN

"*General Arrangement.*—In many parts of the country the most common type of cow-house is that represented in Fig. (1) 16,

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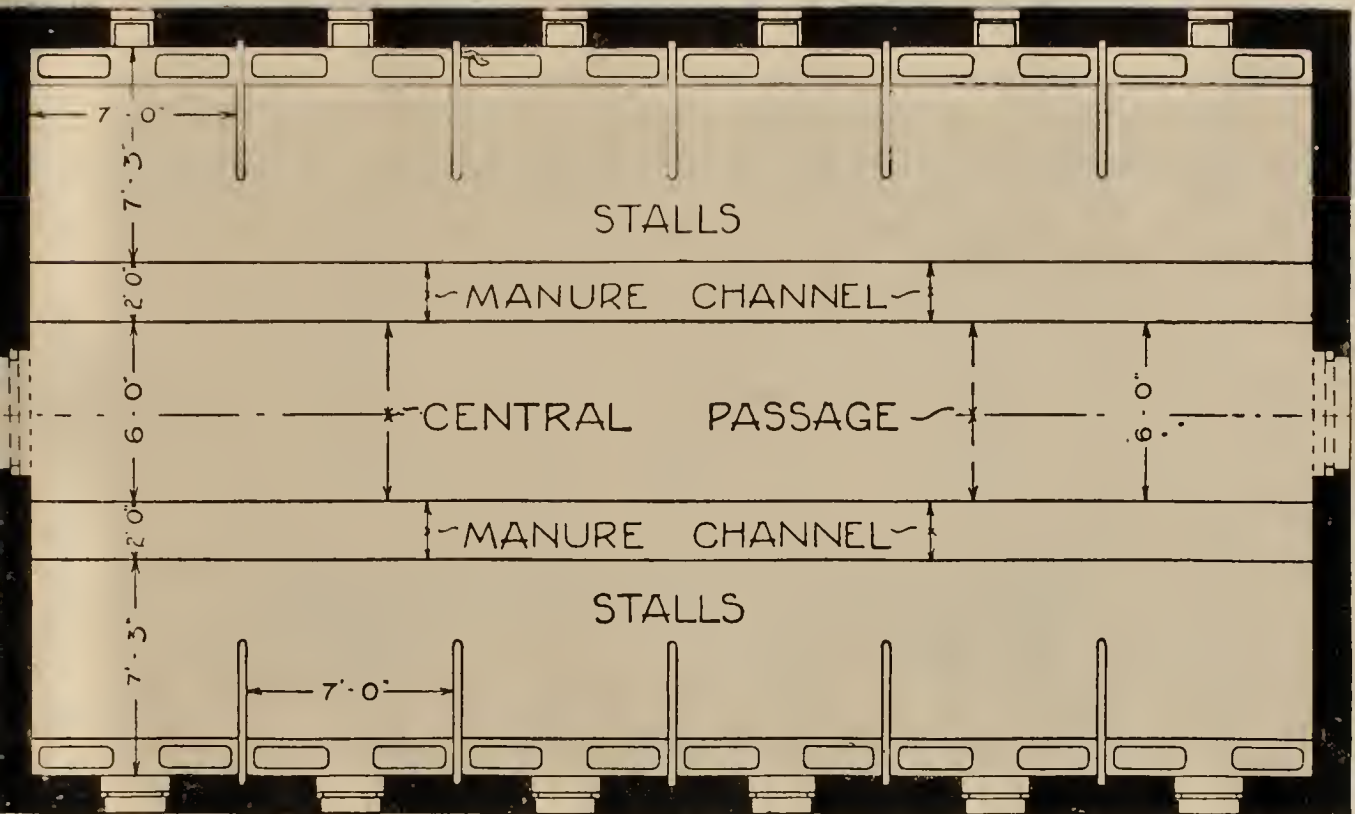
— COW-HOUSE —
— WITH TWO ROWS OF STALLS —

Fig. (1) 10

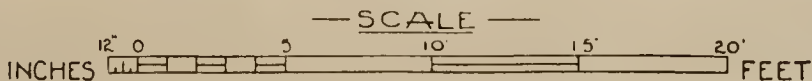
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in which the cows are stalled with their heads to one of the outside walls. In such a case, the one central passage serves the purpose for conveying the food to the cows, removing the manure, and taking away the milk.

"This type of cow-house may be double as shown, or single, the former being the cheapest building that can be erected.



— GROUND - PLAN —



• FOR INTERIOR VIEW OF THIS COW-HOUSE SEE FIG.(I)16 •

Fig. (IA) 17

"The interior dimensions of this building are given in Fig. (IA) 17, which is a ground plan of the cow-shed, from which it will be seen that the distance from side to side is 24 feet 6 inches. The roof span would therefore be from 26 to 27 feet, and this would enable the building to be erected at a smaller cost than the alternative plan shown in Fig. (3) 19. The width of the central passage might be increased to 7 feet or 7 feet 6 inches without any very material difference in the cost. The greater width promotes cleanliness, and is more convenient at milking times.

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"The method of stalling the animals shown in Fig. (2) 18 is one of the oldest and most approved, particularly where existing farm buildings are being utilised. Many ordinary farm buildings are from 18 to 20 feet wide, and can usually be transformed into a cow-house at very moderate expense. Where, however, a new building is to be erected, it will be more economical to adopt the design shown in Fig. (1) 16.

"In Fig. (3) 19 the same principle is followed as in Fig. (2) 18, except that two rows of cows are provided for instead of one. This arrangement has a great deal to recommend it, from various points of view, and though the initial cost is fairly high, the advantages obtained may warrant the extra expense. (It is desirable

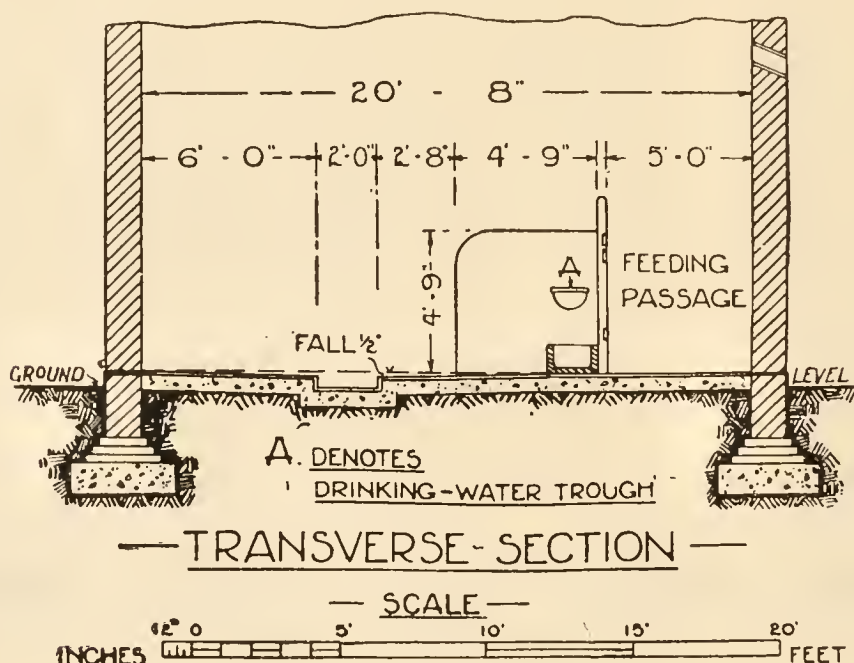
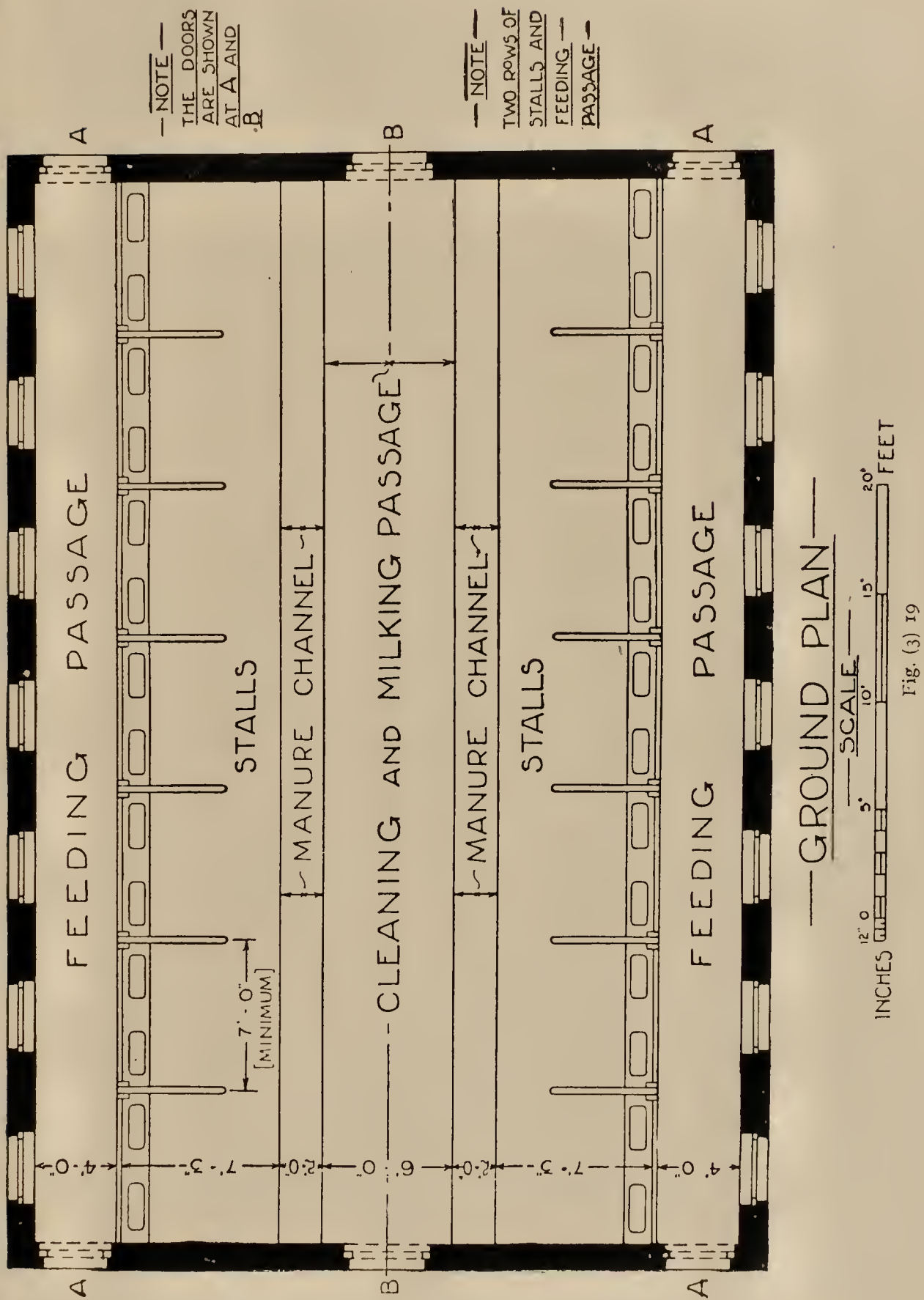


Fig. (2) 18

to provide a certain cubic and floor space for each animal as hereafter explained.) Now, the cost of the extra passage is saved in the walls, which do not require to be made the same height as in a building without any passage at the heads of the cattle. In many of the dairying districts, however, a passage between the heads of the cows and the wall is considered unnecessary and undesirable, because (i) any saving in labour that is effected by feeding the cows from a passage at their heads compared with one from behind is only trifling, and is more than discounted by the extra labour necessary to keep that passage clean; and (ii) when animals have been lying for a time they very often pass some excrement as soon as they rise. Where there is a feeding passage at their heads, the cows usually rise when feeding begins, and in their anxiety to be fed they generally press toward the

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passage, and if the fittings permit of it, they often thrust their heads over the division. Any excrement dropped at this time falls on the floor of the stall instead of in the manure channel. If this is not cleared away soon after, the cow may lie down on it later on, and soil not only her hind-quarters, but also her udder and teats, and clean milk can never be obtained from a dirty cow, much less from one with her udder or teats soiled with her own excrement.

“ There is one type of cow-house which is very common in many districts of Britain, but which is objectionable in several ways. In it all the stock are fed from one central passage, while the manure and the milk are removed by the two at the sides. In this case the cows' heads are a long way from the fresh-air inlets, and the animals breathe into each other's faces from opposite sides of the passage. In a building of this class, unless it is exceptionally well ventilated, the general health of the stock is likely to be low, and one infected animal may cause great damage. Such a cow-house is also defective in that the passages from which the milking is carried on are usually too narrow to secure milk standing in them from risk of pollution.

“ *Passages.*—A feeding passage less than 4 feet wide cannot be worked in with comfort, and it will be all the better if a foot wider. Milking passages, whether in single or double buildings, should not be less than 5 feet wide for single cow-houses and 6 to 7 feet for any double one. Special cans are usually provided for carrying the milk, and at milking time they are left in the passage, the milk being emptied into them as soon as drawn from the cows. When full, they are carried to the dairy or refrigerator and emptied, after which they are returned to their place in the passage. With a passage less than 6 feet wide, in a double cow-house, there is always a risk of the cans and their contents being splashed and contaminated with urine or dung.

“ *Stalls.*—The stalls require a slight incline from the trough to the manure channel. Several times a year the stalls should be scraped and thoroughly cleansed by washing, and unless they are given a fall of from 1 to 2 inches, it is difficult to get the floor dried ; moreover, each stall should be proportionate in length to the class of cow that is expected to occupy it. For small cows such as Jerseys, Kerrys, and young Ayrshires, the stall (measured from the manure channel to the wall or division between the cows and the passage) should be from 6 feet 9 inches to 7 feet long, inclusive of the breadth of the trough. For Ayrshires a stall of 7 feet to 7 feet 3 inches is quite sufficient, while Shorthorns require from 7 feet 3 inches to 7 feet 6 inches, and exceptionally large cows 3 inches more.

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“ If the stalls are too short, the cows will stand in the manure channel, and sooner or later their hind feet become soft and diseased. If the stalls are too long, the stock drop their dung on the floor, and when they lie down are almost sure to soil their hind-quarters or udder. Under such conditions, the labour necessary to keep the stalls and cows reasonably clean is very great. For the smaller cows each double stall should be from 6 feet to 6 feet 6 inches wide, and for the larger ones, from 6 feet 6 inches to 7 feet 6 inches. If the stalls are too narrow the cows tread on each other's legs, udders, and teats, and injury to the two latter almost invariably means loss of a quarter. If the stalls are too wide, the cows turn round in them and drop urine or excrement in the trough or on the floor of the stall.

“ The back part of the stall may be of cement concrete, blue brick, or stone; the front part should be of brick or hard asphalt only.

“ *Stall Divisions.*—The stall divisions may be of cement concrete, stone, wood, or iron, or they may be dispensed with if stanchions are used. Coloured or uncoloured cement 3 inches thick makes, however, one of the strongest, neatest, and most serviceable divisions, periodic washing with water or lime-wash being all that is required to keep it clean and bright. The stall divisions should not be less than 4 feet 6 inches long and 4 feet to 4 feet 3 inches high.

“ *Troughs.*—Each cow should have a separate feeding-trough of thoroughly glazed fireclay. Troughs 20×16×8 inches are quite large enough for most purposes, and the space between the troughs should be filled with brick.

“ All corners at the back and end of the troughs should be filled up with cement to as long a slope as possible, in order to ensure thorough cleanliness. Where it is desired to supply the stock with water when in the house, one of the best methods is to have small circular troughs 9 inches or so in diameter, set in a recess cut out of the stall division close to the wall or division, and one foot or so above the trough. These troughs should have a lid which is hinged at the back and projects over the edge half an inch or so, and so arranged that it cannot be lifted up to a perpendicular position.

“ All stock seem to learn to lift the lid with their nose in a few days, and as soon as they have satisfied their thirst, the lid falls and keeps out dust, straw, etc.

“ The level of the water in the troughs may be regulated by a ball cock.

“ *Manure Channel.*—Probably no part of the average cow-house is constructed in so faulty a manner as the manure channel.

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In no case should it be less than 24 inches wide, and for large-sized cows it may with advantage be increased to 27 or 28 inches.

“It should not be less, and need not be greater, than 6 inches deep at the cow’s heels, and at the side next the passage 4 inches will be quite enough. A fall lengthwise in the floor of the channel of half an inch for each cow is quite sufficient. These items are of importance in connection with the cleanliness of the animals, and indirectly with the purity of the milk.

“If the channel is any narrower than suggested, it may quickly become blocked with manure from side to side, and the urine thus remains dammed, for the time being, between each heap of manure; the result is that every time a cow lies down, there is a liability of her tail dropping into the pool of urine; under such conditions milk is almost certain to be contaminated.

“AIR SPACE.

“*Floor Space.*—The question of floor space is undoubtedly one to which more attention might be given. Floor space is closely associated with the feeding and milking of the cows, with the removal of the manure, and more especially with the cleanliness of the milk. The area required by a cow for her comfort is very much regulated by her size, but all cows require about a similar number of square feet for proper attention. With passages of the width suggested for the different designs of cow-houses, a floor space of from 40 to 50 square feet will be provided per cow.

“*Cubic Space.*—Opinions as to the suitability or unsuitability of a cow-house from a sanitary point of view are frequently based on the amount of cubic space provided. This is due to the idea that in a building with a large cubic space the air remains approximately pure much longer than where the cubic space is smaller. Where buildings are occupied for a limited time compared with the interval during which they are empty, the inference is reasonably sound, but when applied to the case of a cow-house in which the animals are constantly stalled for half the year, it is open to criticism. In the one case, the building is flushed with fresh air in the intervals between its occupation, while in the other it is seldom that such an opportunity occurs. The consequence is that the air of a cow-house, no matter how large its cubic space, reaches a high degree of impurity in an hour or two after it becomes occupied, unless provision is made for removing the polluted air and replacing by that which is pure. This was strikingly brought out in the experiments of the Highland and Agricultural Society during the winter of 1908 and 1909, which showed that there is

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no substantial gain in purity of the air in buildings of very large cubic capacity per cow compared with those of more moderate size, and that if any cow-house, no matter what its cubic space per cow, is kept at a temperature of 60 degrees F. or more, its air will contain about three times as much carbon dioxide as if the building were freely ventilated and kept at under 50 degrees F. While the production may be as great in the one case as in the other, the health of the animals in a freely ventilated small building will be better than that of those in a larger but poorly ventilated building. If provision is made for ventilation, and the other details in connection with the construction of the building are attended to, it will be found that 600 to 800 cubic feet of space constitute an ample allowance.

“ VENTILATION.

“ Closely associated with cubic space, but in reality quite a separate subject, is that of ventilation. While a certain floor and cubic space must be provided for before the cows can be conveniently and economically attended to, the health of the animals and purity of the milk will in great part depend on the means provided for ventilating the building. The thoroughness of the ventilation is much more a matter of providing in the walls ample openings of any kind as inlets for the air, and similar openings in the roof as exits, rather than any special system of ventilation. The great requisite is to provide for each animal plenty of inlet area, which should not be less than 40 square inches per cow, irrespective of doors or windows, which should be reserved for exceptional weather; if the situation is at all sheltered, a larger inlet area should be provided.

“ It does not follow that all available ventilation should be always utilised, but sufficient openings should exist to keep the air fresh—say, one volume of carbon dioxide per 1000 volumes—when the stock are in and the air is calm.

“ These openings should be provided with some arrangement by which the inlet of air can be easily regulated to suit the conditions of the weather. The outlet ventilating openings should not be less in area than the inlets, and may with advantage be twice as large. Like the inlets, the outlets should be provided with some means of partially closing them when it is desired to do so.

“ One of the simplest and most serviceable of inlet openings is a flat one, 24 inches by 4 inches, or 18 inches by 6 inches, in the wall opposite each double stall. This opening should be between 5 and 6 feet from the floor if the animals are stalled with their

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heads to the wall, but if a passage intervenes it may be somewhat lower, as in this case the current of cold air becomes modified and diffused in its course across the passage before it reaches the cows. If a board 9 to 12 inches broad and 24 inches long is placed flat along the bottom of this opening, and the edge next the outside of the wall is hinged in any convenient manner, an arrangement can be easily fitted up by which each or all of these boards can be raised, so as to reduce wholly or partially the incoming current of air. The valve may not only be used for reducing the volume of air entering the building, but also for diverting the current in an upward direction, so that it may pass over the bodies of the cows.

“There are numerous devices for attaining the same end, all of which serve the purpose fairly well.

“The simplest system of roof ventilator is a box extending over two or three of the couples and rising 18 to 24 inches above the ridge, and having louvre boards on the sides.

“The main point in these is to have them large enough and in sufficient number. Another method is to have the boarding of the roof, for a foot or so on each side of the ridge, hinged on the under edge, so that it opens up and leaves an outlet 12 inches or so wide, the whole length of the building. Arrangements have to be made, of course, for raising and lowering the flaps from the floor.

“LIGHT

“Sunlight is one of the most powerful germicides, and should therefore be admitted freely into all buildings occupied by stock. It is a matter of indifference whether it comes from the walls or roof, provided it is ample and does not fall directly on the eyes of the animals. The minimum space which should be allowed for windows is not less than 2 or 3 square feet per cow, and it will be an advantage to have somewhat more. Nothing will contribute so much to cleanliness in the cow-house as plenty of light.”

This leaflet which we have just discussed was issued for the guidance of all interested in the construction of dairies, and it fully embodies all the best ideas for the up-to-date and hygienic housing of cattle and the production of milk under the best conditions.

There are one or two points, however, in the leaflet which do not find favour with some authorities or with sanitarians. It would be noted that in the recommendations as regards the walls, that wood, or wood and corrugated iron, might be used, but these

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materials neither give that finish which is desired, nor are they so comfortable as might be desired, while, where wood is the material used, there is always a danger should fire take place.

Again, the Board evidently prefer blue bricks to cement for the upper part of the stalls, whereas many who have a good deal of experience in this matter prefer the whole of the floors, channels, and passages to be of cement concrete, with the stalls V-grooved.

So far, we have dealt only with the housing of the cows in the dairy. Let us now look at some other particulars which require our attention in the important question of milk production. First, then, with regard to the animals themselves. The cows should be kept clean in their stalls, and only straw should be employed for bedding purposes.

Every day each animal should be thoroughly groomed with a curry comb and hard bristle brush. By doing so, not only will the appearance of the animal be much improved, but there will be less danger of pollution from matter adhering to the hide of the cows.

During milking operations, a pail of tepid water should be kept in the byre, and before milking, the udder and teats of the cow should be washed, as should also the milker's hands before beginning and after finishing the milking of each animal. When the milk has been drawn from each cow, the usual practice is to empty the milk into a large can kept standing in the passage to receive the supply. These cans should be of the narrow-neck variety, and should be fitted with a lid attached by a short chain to the handle. The object of the lid is to exclude any risk of pollution, and the reason for the chain is to prevent any careless person from putting the lid down on the floor while the milk is being emptied into the can. Moreover, when a chain is not provided, it will usually be found that the lid is put on the floor, and as a consequence, when again picked up it carries with it certain polluting matter which eventually drops into the milk.

In some dairies the milk is passed through a sieve in the byre after being drawn from the cow, but in other cases the can, when full, is conveyed to the dairy and there put through the sieve. These sieves are of very fine mesh, which will arrest any floating matter which may have got inadvertently into the milk, as, for instance, a small piece of hay or straw. Not content with simply the metal sieve, however, many dairymaids take the trouble of fixing a piece of clean white muslin over the sieve to further assist in the process.

The dairy to which the milk is taken should be a large, well-ventilated apartment, and while well lit should be so situated that it is sheltered from the sun's rays. The floor should be of cement concrete or stone slabs laid on a bed of good lime, and

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the joints grouted with cement. It ought to be furnished with stone shelves in preference to wooden ones, and the interior of the walls ought to be finished smooth, either in cement or glazed tiles. If the latter method be employed, the tiles can be washed down each day without much trouble. Should the walls be finished in plaster or cement, however, they then require to be limewashed periodically. There must be no opening to a drain within the dairy, and the floors and shelves should be washed regularly every day.

In most large dairy farms, a necessary adjunct to the dairy itself is the room in which the machines are driven for separating the milk, churning, etc.

Here again the floor should be of a hard, impervious material, and also the walls of the room. This apartment should be limewashed periodically, and the floor washed daily, while the machines should be thoroughly cleaned after every operation.

A large wash-house with boiler must also be provided for scalding and washing the cans and utensils used in connection with the milk supply. It is absolutely essential that all cans should be scoured, plotted, and made scrupulously clean after each time of using.

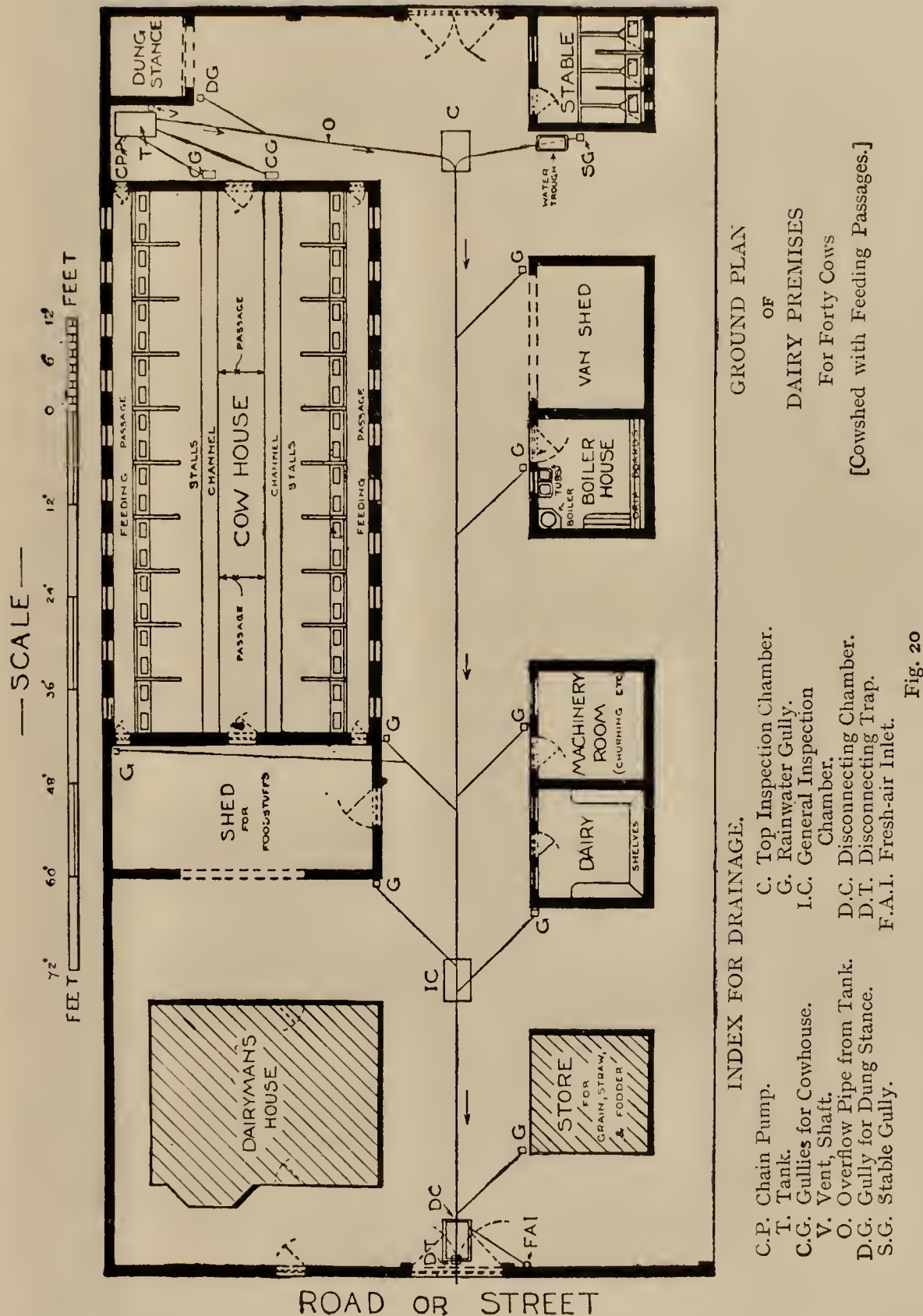
Nothing goes bad quicker than milk, and no smell is more difficult to remove from a can than that of milk which has been standing for a few days.

So much, then, for the principal matters which call for attention in connection with milk production on a dairy farm. In Fig. 20 we have a plan of a modern dairy farm, showing the position of cow-houses, dairy, and boiler-house for scalding utensils, etc. In their Regulations as to Dairies, Cow-sheds, and Milk-shops, many Local Authorities insist on the following: Lighting, 3 square feet of glass per animal; cubic space, 800 cubic feet; internal walls, smooth finished, up to 6 feet from floor; single stalls, 8 feet by 4 feet; double stalls, 8 feet by 7 feet 6 inches; limewashed every May and October, or as often as the sanitary inspector requires.

As would be noted at the beginning of this chapter, certain of the supplies of milk for our large towns and cities come long distances by rail. Railway companies provide a special type of van for this class of traffic, and at its destination it is taken away by milk purveyors—i.e. persons licensed by the Local Authorities to purvey milk to the public. Thus, the milk may be sold from carts or barrows on the streets, or delivered at the houses of the purveyor's customers. The inspector must exercise rigid supervision of the cleansing of the purveyor's milk-vessels. As a general rule, these purveyors do not store the milk, but simply order a sufficient quantity to meet the daily wants of their customers.

Unfortunately, while the railway companies do a great deal

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towards carrying the milk, very little is done to secure cleanliness when the milk has arrived at its destination. Here one may see the cans or barrels put on the station platform, the lids removed, cans dipped into the milk and lids lifted off the dirty pavement, where they have been thrown and carelessly replaced on a can of milk. The only cure for this is that the Local Authority of the district should insist on a clearing-house system where all milk coming in by rail would be received and reissued to the purveyors on proper hygienic lines.

The other method of milk supply is from dairies and dairy farms outwith the district of the Local Authority which is being served. This method requires little comment here, as a sharp watch can be kept on the purveyors' utensils and samples of the milk taken to ensure its purity and requisite standard.

The purveyors have, of course, to be registered by the Local Authority of the district in which they sell their milk.

We now come to milk-shops. In some cases only milk and farm produce are sold, such as butter, eggs, etc., but one very often finds small shops licensed as milk-shops which also sell groceries, vegetables, and various sundry wares. On the face of it, this idea is ridiculous, as no matter how carefully the business is conducted, pollution to a greater or less degree of the milk will take place. Certain requirements for these shops are laid down in the regulations affecting them, which we will deal with in the next chapter.

It would be a big advantage if licences for this type of shop were confined to those only dealing in dairy or farm produce, while all vessels containing milk should be kept covered, when not in use, by a clean fine gauze or muslin cover.

In inspecting dairy premises, the inspector should do so in a systematic fashion and make a point of paying a visit while milking operations are in progress. Should any animal catch the eye, which is suffering from, or appears to be suffering from, any disease, the attention of the dairyman should be drawn to the fact, and he should be advised to separate it for a time from the rest of the herd. Further, the inspector may give a hint of such cases to the veterinary inspector of the district. It is also the duty of the owner of dairy premises to notify the existence of an outbreak of disease among his stock.

STABLES AND PIGGERIES

Stables and piggeries often have to be dealt with by an inspector when dealing with dairies, and for that reason we will take them here.

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Stables and piggeries require a good deal of attention in order to keep down nuisances in connection with them ; it is therefore to our advantage to study these structures in order to find out what is required of them, and what must be rigorously kept in check.

The powers vested in Local Authorities for dealing with the keeping of animals might easily be extended with advantage to all concerned. As they stand, our powers are roughly as follows :—

PUBLIC HEALTH ACT, 1875.

Section 44.—“ Any Urban Authority may also make byelaws for the . . . prevention of the keeping of animals on any premises so as to be a nuisance or injurious to health.”

Section 47.—“ Any person who in any urban district . . . keeps any swine or pig sty in any dwelling-house, or so as to be a nuisance to any person.”

Section 91, Subsection 3.—“ Any animal so kept as to be a nuisance or injurious to health.”

From these excerpts it will be seen that the powers are rather limited, and apply only to Urban Authorities.

Dealing with stables first, one very often finds any kind of old building used for the purpose ; sometimes an old shed may constitute a stable, or indeed an old erection of any kind. The greatest trouble with these buildings is the fact that they are rarely drained, or if drained, the drainage is so old and obsolete that it is more of a nuisance than an aid to sanitation. Internally in these old structures the partitions or divisions for stalls are made of any kind of old boarding, while the walls are rough and lend themselves to the collection of dust, etc.

Another source of trouble with this type of stable is the storage of the manure. In many cases, the manure is kept inside the stable itself, and where it is put outside, no proper provision for its storage is provided. The ventilation of these old buildings is usually either too good or too bad.

In districts where the Local Authority have made byelaws for dealing with stables, very little trouble will be experienced in handling this branch of the work, but as it is the exception, rather than the rule, to find byelaws made by Authorities, it behoves every inspector to deal very vigorously with this matter at all times. Suppose, then, we were asked to construct a stable for three horses, and having regard to the sanitary requirements of the matter, how should we proceed ?

First, we should ensure that sufficient floor space or area be provided, and to do this the stable ought to be 18 feet long by 17 feet broad in internal dimensions.

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The height of the walls should be 12 feet from floor to eaves and 20 feet from floor to ridge. The building should be of brick or stone, built with good mortar, the roof being boarded and slated in preference to tiles.

The dimensions quoted would give 100 square feet of floor space per horse, and fully 1600 cubic feet of air space per animal.

The interior of the walls ought to be coated with cement, finished with a smooth surface, or they may be tiled with glazed tiles or bricks.

The floor should be of channelled blue brick, set in cement, on a good bed of Portland cement concrete, or of some other suitable impervious material which must not have a slippery surface.

The floor, moreover, should be laid to slope towards shallow open channels made for receiving the drainage. These channels must be carried, by means of a pipe, through the wall of the stable and discharge over a "trapped gully" of a special type.

The stalls themselves should be 5½ feet wide, and the dividers ought to be of some suitable hard wood varnished, such as pitch pine, teak, etc., or they may be of metal.

The stalls ought to be provided with the usual racks for hay, and a drinking-trough of enamelled iron with small section for oats, etc., should be fitted.

Water ought to be laid on in the stable for flushing purposes, and a stand pipe provided for that purpose.

An allowance of 15 gallons of water per day per horse must also be provided.

Means of ventilation may be provided by gratings or air pipes in the walls above the horses' heads, and also by louvres in the roof.

Windows may be made in the gables or wall opposite the stalls, and these windows should be, say, 4 feet by 3 feet in size.

An iron cage or a built receptacle should be provided outside the door of the stable to receive the manure, which ought to be removed as frequently as possible.

The interior walls of the stable ought to be limewashed, this operation being repeated once every six months.

Dealing now with **piggeries**, one usually finds these a very great source of nuisance. One would think, when looking at some of these erections, that the great factor in keeping pigs was to get as old and insanitary a place as possible. Certainly, this type of business does not easily lend itself to be conducted without causing some little offence, but if the styes are properly built, and cleanliness enforced, and ordinary attention given to the care and management of them, then there is little likelihood of there being a great deal of nuisance from this source.

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The difficulty in dealing with piggeries lies, to a great extent, in the diversity of opinions held by pig-rearers themselves. Some contend that styes must be open, or at least the pens of them must be so ; others, again, hold that where the pens and styes are covered over, better results are obtained.

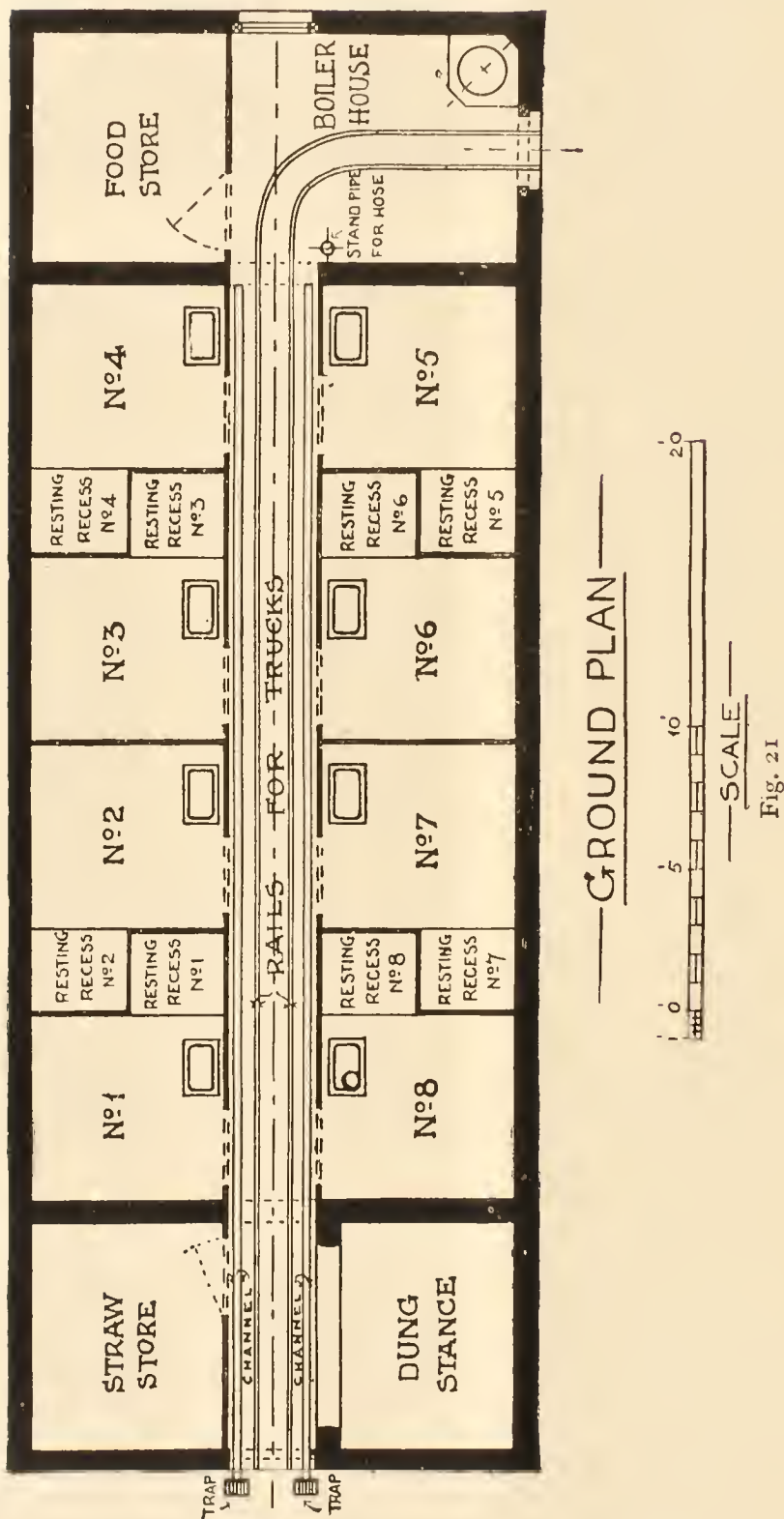
Most of them, however, agree that swine do not thrive where the pens are kept thoroughly clear of litter and manure, and that floors of an impervious material quickly put an animal "off the legs," and so on. Under these circumstances, therefore, we find very often that not only are the styes built of old timbering, which is a nuisance owing to its being soaked with liquid manure and filth and with the slops used for feeding, but the pen itself is foul, from the fact that it is used as a manure heap, so that the pigs may tramp it down, and so add to its virtue as a manure. The slops used for feeding are very often left "sitting about" in pails, tubs, or barrels, and here another source of trouble arises, as this pigs' food attracts vermin, such as rats, to the neighbourhood of the piggery.

Many methods and types of piggeries have been suggested as the best methods of construction, but one type of piggery with which the author is familiar, and which has been under his observation for some time, seems to meet the requirements in every way.

As seen in Figs. 21 and 22, which are a plan and cross section of the piggery, the styes are contained in a building under a roof. The main structure is of brick, with roof of wood and slates, and fitted with louvres and skylights. The main building has a passage running the length of the piggery, the styes being on either side of this passage. At one end is a boiler-house with accommodation for the storage of the food. At the other end of the building is a dung stance of not too large dimensions for the storage of manure. The floors of the whole building are of cement concrete, and the styes are given a fall to an open channel which runs along the side of the central passage.

These channels are carried by means of pipes through the external walls of the building and made to discharge over traps connected to a drain. The walls of the building are rendered in cement finished with a smooth surface.

The dividers or partitions are of iron in this case, although they could be of concrete or stone slabs. A door is provided to each pen, which opens into the passage. Particular attention should be paid to the shape of every alternate divider as shown in sketch. By having them built in this fashion, we get two recesses, one recess for each pen, in which the pigs may rest. The floors of these recesses are three inches higher than the remainder



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of the floor, and they have a layer of straw, for bedding purposes, in them. The floor of the pen has no litter or straw on it, and an enamelled fireclay trough is fixed for feeding purposes. A stand-pipe and hose are provided for flushing purposes, the styes being thoroughly flushed out every day. The interior of the building is limewashed periodically, and kept scrupulously clean. Rails

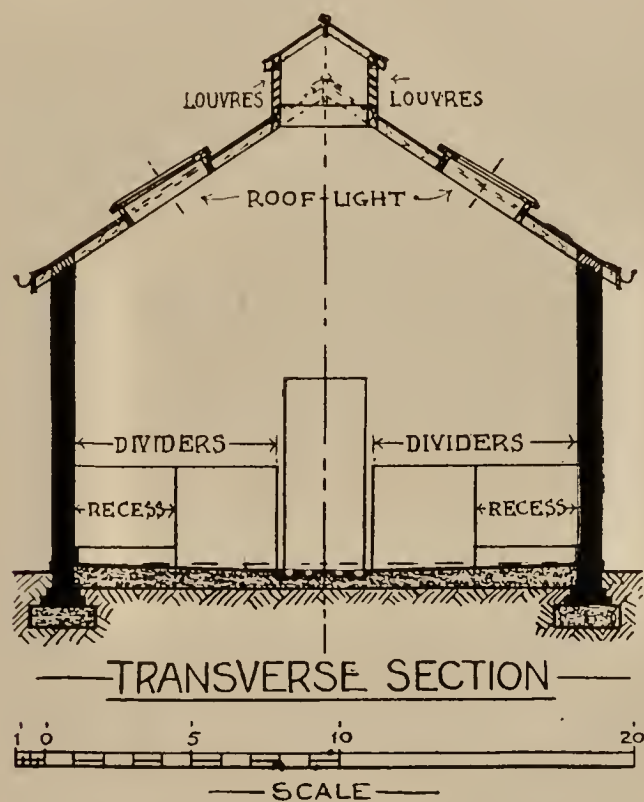


Fig. 22

are laid along the passage, and on them trucks convey the food to the styes, while other trucks are used to remove the manure to the dung pit.

This type of piggery has a great deal to commend it, and has given satisfactory all-round results.

The pigs are always clean, and there is no nuisance, while from the commercial point of view, the results are said to be as good as those gained from a sanitary standpoint.

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Chapter X

LAW RELATING TO DAIRIES, COW-SHEDS, AND MILK-SHOPS

As already stated in the previous chapter, the powers for the regulation of dairies, cow-sheds, and milk-shops, were vested in the Privy Council, but by *Section 9* of the **Contagious Diseases (Animals) Act, 1886**, these powers were transferred to the Local Government Board, now the Ministry of Health.

This section is all that remains unrepealed of the Act of 1886, while with regard to the **Contagious Diseases (Animals) Act, 1878**, the only part which has not been repealed is *Section 34*. This section is of great importance, and the foundation for all byelaws in connection with this subject ; we will therefore take it here in full, viz. :—

“ *Section 34*.—The Privy Council (now the Ministry of Health, by reason of the powers of *Section 9* of the Act of 1886 above referred to) may from time to time make such special or general orders as they think fit, subject and according to the provisions of this Act, for the following purposes or any of them :—

1. For the registration with the Local Authority of all persons carrying on the trade of cowkeepers, dairymen, or purveyors of milk.
2. For the inspection of cattle in dairies, and for prescribing and regulating the lighting, ventilation, cleansing, drainage, and water supply of dairies and cow-sheds in the occupations of persons following the trade of cowkeeper or dairyman.
3. For securing the cleanliness of all milk-stores, milk-shops, and milk-vessels used for containing milk for sale by such persons.
4. For prescribing precautions to be taken for protecting milk against infection and contamination.
5. For authorising a Local Authority to make regulations for the purposes aforesaid or any of them, subject to such conditions, if any, as the Privy Council prescribe.”

Next we have a very important piece of legislation, namely, the **Contagious Diseases (Animals) Act, 1894**, and under this Act all powers relating to outbreaks of cattle plague, pleuro-pneumonia, foot and mouth disease, and swine fever are conferred on the Board

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of Agriculture. All burghs of over ten thousand population are charged with carrying out the provisions of the Act, and the Local Authority may appoint as many inspectors for carrying out the provisions of the Act as they deem necessary, and at least one of these inspectors shall be a veterinary inspector, while in addition the police are empowered to assist in the execution of the provisions of the Act.

The powers governing dairies, cow-sheds, and milk-shops may be said to be governed by the Local Government Board's **Dairies, Cow-sheds, and Milk-shops Orders, 1885-6.**

These Orders are of great importance, and the following points should be noted in connection with the same :—

By *Section 6*, every cowkeeper, dairyman, or purveyor of milk must register himself with the sanitary authority, even though there may be objections to the premises occupied by the applicant ; the question of dealing with the unsuitability of the premises apparently falling to be dealt with after the party has been registered. Evidently this question of registration is one of persons rather than of premises. Under this same section, persons who only make and sell butter and cheese, or who sell the milk of their own cows, in small quantities, to their workers or neighbours for their convenience and accommodation, are exempted from registration.

Under *Section 7*—“ 1. It shall not be lawful for any person following the trade of cowkeeper or dairyman to begin to occupy as a dairy or cowshed any building not so occupied at the making of this Order, unless and until he first makes provision, to the reasonable satisfaction of the Local Authority, for the lighting and the ventilation, including air space, and the cleansing, drainage, and water supply of the same, while occupied as a dairy or cowshed.

“ 2. It shall not be lawful for any such person to begin so to occupy any such building without first giving one month's notice in writing to the Local Authority of his intention so to do.

“ It shall not be lawful for any person following the trade of cowkeeper or dairyman to occupy as a dairy or cowshed any building, whether so occupied at the making of this Order or not, if, and as long as, the lighting and ventilation, including air space, and the cleansing, drainage, and water supply thereof, are not such as are necessary or proper :—

- (a) For the health and good condition of the cattle therein ; and
- (b) For the cleanliness of milk vessels used therein for containing milk for sale ; and
- (c) For the protection of the milk therein against infection and contamination.”

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This Order also inflicts a penalty, and forbids under penalties the occupier or any other person engaged in the production, storage, or distribution of milk, either when suffering from any infectious disorder, or having been recently in contact with anyone so suffering, until all danger of infection has ceased.

After one month's notice from the Local Authority, no place must be used as a milk-store which is in communication with any water-closet, earth-closet, privy, cesspit, or urinal.

The Order also prohibits for use as a milk-store or milk-shop any place used as a sleeping apartment, and the keeping of swine on milk premises, while it further prohibits the sale of milk from diseased cows for human food.

This Order authorises Local Authorities to make regulations :—

- (a) For the inspection of cattle in dairies.
- (b) For prescribing and regulating the lighting, ventilation, cleansing, drainage, and water supply of dairies and cow-sheds in the occupation of persons following the trade of cowkeepers or dairymen ;
- (c) For securing the cleanliness of milk-stores, milk-shops, and of milk-vessels used for containing milk for sale by such persons ;
- (d) For prescribing precautions to be taken by purveyors of milk and persons selling milk by retail against infection or contamination.

It will be noted that this latter part of the Order is in most respects similar to Section 34 of the **Contagious Diseases (Animals) Act, 1878.**

The Local Government Board have issued the following **Model Regulations** with respect to **Dairies, Cow-sheds, and Milk-shops** for the guidance of sanitary authorities :—

“ Interpretation

“ 1. Throughout these regulations the expression ‘ The Council ’ means the ; the expression ‘ District ’ means the ; the expression ‘ Cow-shed ’ includes any dairy in which milking cows may be kept, and the expression ‘ Cowkeeper ’ means any person following the trade of a cow-keeper or dairyman who is, or who is required to be, registered under the Dairies, Cow-sheds, and Milk-shops Order of 1885.

“ For the Inspection of Cattle in Dairies.

“ 2. Every occupier of a dairy wherein cattle may be kept and which the medical officer of health, or the inspector of nuisances,

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or any other officer of the Council specially authorised by them in that behalf, may visit, for the purpose of inspecting cattle, and every person for the time being having the care or control of any such dairy, or of any cattle therein, shall afford such medical officer of health, inspector of nuisances, or officer, all reasonable assistance that may, for the purpose of the inspection, be required by him.

“ For prescribing and regulating the lighting, ventilation, cleansing, drainage, and water supply of cow-sheds and dairies in the occupation of persons following the trade of cowkeepers or dairymen.

PART I

“ The regulations in this Part shall apply to cow-sheds, the cows from which are habitually grazed on grass-land during the greater part of the year, and when not so grazed, are habitually turned out during a portion of each day.

“ *Lighting*

“ 3. Every cowkeeper shall provide that every cow-shed in his occupation shall be sufficiently lighted with windows, whether in the sides or roof thereof.

“ *Ventilation*

“ 4. Every cowkeeper shall cause every cowshed in his occupation to be sufficiently ventilated, and for this purpose to be provided with a sufficient number of openings into the external air to keep the air in the cow-shed in a wholesome condition.

“ *Cleansing*

“ 5. (1) Every cowkeeper shall cause every part of the interior of every cow-shed in his occupation to be thoroughly cleansed from time to time as often as may be necessary to secure that such cow-shed shall be at all times reasonably sweet and clean.

“ (2) Such person shall cause the ceiling, or interior of the roof, and the walls of every cow-shed in his occupation to be properly limewashed *twice* at least in every year—that is to say, *once* during the month of May, and *once* during the month of October, and at such other times as may be necessary.

“ Provided that this requirement shall not apply to any part of such ceiling, roof, or walls that may be properly painted, or varnished, or constructed of, or covered with, any material such

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as to render the limewashing unsuitable or inexpedient, and that may be otherwise properly cleansed.

“(3) He shall cause the floor of every such cow-shed to be thoroughly swept, and all dung and other offensive matter to be removed from such cow-shed as often as may be necessary, and not less than *once* in every day.

“ *Drainage*

“ 6. (1) Every cowkeeper shall cause the drainage of every cow-shed in his occupation to be so arranged that all liquid matter which may fall or be cast upon the floor may be conveyed by a suitable open channel to a drain inlet situate in the open air at a proper distance from any door or window of such cow-shed, or to some other suitable place of disposal which is so situate.

“(2) He shall not cause or suffer any inlet to the drain of such cow-shed to be within such cow-shed.

“ *Water Supply*

“ 7. (1) Every cowkeeper shall keep in, or in connection with, every cow-shed in his occupation a supply of water suitable and sufficient for all such purposes as may from time to time be reasonably necessary.

“(2) He shall cause any receptacle which may be provided for such water to be emptied and thoroughly cleansed from time to time, as often as may be necessary to prevent the pollution of any water that may be stored therein; and where such receptacle is used for the storage only of water, he shall cause it to be properly covered and ventilated, and so placed as to be at all times readily accessible.

“ PART II

“ The regulations in Part I, and also the following regulations, shall apply to all cowsheds other than those the cows from which are habitually grazed on grass-land, during the greater part of the year, and, when not so grazed, are habitually turned out during a portion of each day.

“ 8. A cowkeeper shall not cause or allow any cow-shed in his occupation to be occupied by a larger number of cows than will leave not less than *eight hundred feet* of air space for each cow.

“ Provided as follows :—

(a) In calculating the air space for the purposes of this regulation, no space shall be reckoned which is more than *sixteen feet* above the floor; but if the roof or ceiling

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is inclined, then the mean height of the same above the floor may be taken as the height thereof for the purpose of this regulation.

- (b) This regulation shall not apply to any cow-shed constructed and used before the date of these regulations coming into effect, until two years after that date.

“ PART III

“ 9. In this Part the expression ‘ dairy ’ means a dairy in which cattle are not kept.

“ *Lighting*

“ 10. Every cowkeeper shall provide that every dairy in his occupation shall be sufficiently lighted with windows, whether in the sides or roof thereof.

“ *Ventilation*

“ 11. Every cowkeeper shall cause every dairy in his occupation to be sufficiently ventilated, and for this purpose to be provided with a sufficient number of openings into the external air to keep the air in the dairy in a wholesome condition.

“ *Cleansing*

“ 12. (1) Every cowkeeper shall cause every part of the interior of every dairy in his occupation to be thoroughly cleansed from time to time as often as may be necessary to secure that such dairy shall be at all times reasonably clean and sweet.

“ (2) He shall cause the floor of every such dairy to be thoroughly cleansed with water at least *once* in every day.

“ *Drainage*

“ 13. (1) Every cowkeeper shall cause the drainage of every dairy in his occupation to be so arranged that all liquid matter which may fall or be cast upon the floor, may be conveyed by a suitable open channel to the outside of such dairy, and may there be received in a suitable gully communicating with a proper and sufficient drain.

“ (2) He shall not cause or suffer any inlet to any drain of such dairy to be within such dairy.

“ *Water Supply*

“ 14. (1) Every cowkeeper shall cause every dairy in his occupation to be provided with an adequate supply of good and

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wholesome water for the cleansing of such dairy and of any vessels that may be used therein for containing milk, and for all other reasonable and necessary purposes in connection with the use thereof.

“ (2) He shall cause every cistern or other receptacle in which any such water may be stored to be properly covered and ventilated, and so placed as to be at all times readily accessible.

“ (3) He shall cause every such cistern or receptacle to be emptied and thoroughly cleansed from time to time, as often as may be necessary to prevent the pollution of any water that may be stored therein.

“ FOR SECURING THE CLEANLINESS OF MILK-STORES, MILK-SHOPS, AND OF MILK-VESSELS USED FOR CONTAINING MILK BY PERSONS FOLLOWING THE TRADE OF COWKEEPERS OR DAIRYMEN.

“ Cleanliness of Milk-stores and Milk-shops

“ 15. Every occupier of a milk-store or a milk-shop shall cause every part of the interior of such milk-store or milk-shop to be thoroughly cleansed from time to time, as often as may be necessary to maintain such milk-store or milk-shop in a thorough state of cleanliness.

“ Cleanliness of Milk-vessels

“ 16. (1) Every cowkeeper shall, from time to time, as often as may be necessary, cause every milk-vessel that may be used by him for containing milk for sale to be thoroughly cleansed with steam or clean boiling water, and shall otherwise take all proper precautions for the maintenance of such milk-vessel in a constant state of cleanliness.

“ (2) He shall, on every occasion, when such vessel shall have been used to contain milk, or shall have been returned to him after having been out of his possession, cause such vessel to be forthwith so cleansed.

“ FOR PRESCRIBING PRECAUTIONS TO BE TAKEN BY PURVEYORS OF MILK AND PERSONS SELLING MILK BY RETAIL AGAINST INFECTION OR CONTAMINATION.

“ 17. (1) Every purveyor of milk, or person selling milk by retail, shall take all reasonable and proper precautions in, and in connection with, the storage and distribution of the milk, and otherwise to prevent the exposure of the milk to any infection or contamination.

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“ (2) He shall not deposit or keep any milk intended for sale :—

- (a) In any room or place where it would be liable to become infected or contaminated by impure air, or by any offensive, noxious, or deleterious gas or substance, or by any noxious or injurious emanation, exhalation, or effluvium ; or
- (b) In any room used as a kitchen or a living-room ; or
- (c) In any room or building, or part of a building communicating directly by door, window, or otherwise with any room used as a sleeping-room, or in which there may be any person suffering from any infectious or contagious disease, or which may have been used by any person suffering any such disease and may not have been properly disinfected ; or
- (d) In any room or building or part of a building in which there may be any direct inlet to any drain.

“ (3) He shall not keep milk for sale, or cause or suffer any such milk to be placed, in any vessel, receptacle, or utensil which is not thoroughly clean.

“ (4) He shall cause every vessel, receptacle, or utensil used by him for containing milk for sale to be thoroughly cleansed with steam or clean boiling water after it shall have been used, and to be maintained in a constant state of cleanliness.

“ (5) He shall not cause or suffer any cow belonging to him, or under his care or control, to be milked for the purpose of obtaining milk for sale :—

- (a) Unless at the time of milking, the udder and teats of such cow are thoroughly clean ; and
- (b) Unless the hands of the person milking such cow also are thoroughly free from all infection and contamination.

“ Penalties

“ 18. Every person who shall offend against any of the foregoing regulations shall be liable for every such offence to a penalty of *five pounds*, and in the case of a continuing offence, to a further penalty of *forty shillings* for each day after written notice of the offence from the Council.

“ Provided, nevertheless, that the justices or court before whom any complaint may be made, or any proceeding may be taken in respect of any such offence, may, if they think fit, adjudge the payment as a penalty of any sum less than the full amount of the penalty imposed by this regulation.

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“ Commencement of the Regulations.

“ 19. These regulations shall come into force on and after the day of 19 .”

(NOTE.—In practice the blanks are, of course, to be filled in as occasions require.)

“ Revocation of Regulations

“ 20. From and after the date on which these regulations shall come into force, all regulations heretofore made under, or having effect in pursuance of the Dairies, Cow-sheds and Milk-shops Order of 1885, shall, so far as the same are now in force in the district, be revoked.”

In the Order of the Local Government Board as to Dairies, Cow-sheds, and Milk-shops, 1885, under date the 15th June 1885, we find the following important Sections :—

“ Contamination of Milk

“ 9. It shall not be lawful for any person following the trade of cowkeeper or dairyman or purveyor of milk, or being the occupier of a milk-store or milk-shop :—

(a) To allow any person suffering from a dangerous infectious disorder, or having recently been in contact with a person so suffering, to milk cows or to handle vessels used for containing milk for sale, or in any way to take part or assist in the conduct of the trade or business of the cowkeeper or dairyman, purveyor of milk, or occupier of a milk-store or milk-shop, so far as regards the production, distribution, or storage of milk ; or

(b) If himself so suffering or having recently been in contact as aforesaid, to milk cows, or handle vessels used for containing milk for sale, or in any way to take part in the conduct of the trade or business, as far as regards the production, distribution, or storage of milk, until in each case all danger therefrom of the communication of infection to the milk, or of its contamination, has ceased.

“ 10. It shall not be lawful for any person following the trade of cowkeeper or dairyman or purveyor of milk, or being the occupier of a milk-store or milk-shop, after the receipt of notice, of not less than one month, from the Local Authority calling

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attention to the provisions of this Article, to permit any water-closet, earth-closet, privy, cesspool, or urinal to be within, communicate directly with, or ventilate into any dairy or any room used as a milk-store or milk-shop.

“ 11. It shall not be lawful for any person following the trade of cowkeeper or dairyman or purveyor of milk, or being the occupier of a milk-store or milk-shop, to use a milk-store or milk-shop in his occupation, or permit the same to be used as a sleeping apartment, or for any purpose incompatible with the proper preservation of the cleanliness of the milk-store or milk-shop, and of the milk-vessels and milk therein, or in any manner likely to cause contamination of the milk therein.

“ 12. It shall not be lawful for any person following the trade of cowkeeper or dairyman or purveyor of milk, to keep any swine in any cow-shed or other building used by him for keeping cows, or in any milk-store or other place used by him for keeping milk for sale.”

Article 15 in the same Order reads :—

“ If at any time disease exists among the cattle in a dairy or cow-shed, or other place or building, the milk of a diseased cow therein :—

- (a) shall not be mixed with other milk ; and
- (b) shall not be sold or used for human food ; and
- (c) shall not be sold or used for food of swine, or other animals, unless and until it has been boiled.”

It will be necessary here to refer to Section 4 of the Infectious Disease (Prevention) Act, 1890, which deals with the question of an outbreak of infectious disease due to the milk supply from any dairy either within or without the district of the Local Authority. We have already discussed that question under “ The Law relating to Infectious Disease,” on pages 37 and 38 of Chapter III. of this volume.

For the definitions of “ dairy ” and “ dairyman,” it is only necessary to refer to page 33 of this work.

The law regarding dairies, cow-sheds, and milk-shops in Scotland is somewhat more extensive. While the Dairies, Cow-sheds, and Milk-shops Orders of 1885-1886 also apply, there are other Acts which must be considered.

First, then, we have the **Cattle-sheds in Burghs (Scotland) Act, 1886**, in *Section 2* of which we have the following definitions :—

“ The words ‘ Cattle-sheds,’ ‘ Cow-houses,’ and ‘ Byres ’ shall mean and include every house, building, shed, yard, or other enclosed place or premises in which bulls, cows, heifers, oxen, or calves are kept or intended to be kept.

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Section 3 gives power to Local Authorities to appoint an inspector for the purpose of inspecting all cattle-sheds, cow-houses, and byres within the district, and for the purpose of licensing premises for such purposes for which the Local Authority may make regulations for securing the proper sanitary condition of the same and for fixing the number of cattle which may be kept in such cattle-sheds, cow-houses, or byres.

By *Section 5*, if any owner or occupier of any cattle-shed, cow-house, or byre is called upon by the Local Authority by written notice to make any sanitary improvement and fail to do so within one month of the service of such notice, such owner or occupier may, on conviction, be fined, and on a second offence, the licence for such premises may be revoked.

Under *Section 6*, licences granted under this Act are to continue in force for one year, and shall be required to be renewed every year, while fourteen days' notice of the intention to apply for a licence must be given in writing to the Local Authority. (*Vide Section 7.*)

We now come to the **Public Health (Scotland) Act, 1897**, where in *Section 3* we get the following definitions :—

“ The word ‘ dairy ’ includes any farm, farm-house, cow-shed, milk-store, milk-shop, or other place from which milk is supplied or in which milk is kept for the purpose of sale.

“ The word ‘ dairyman ’ includes any cowkeeper, purveyor of milk, or occupier of a dairy.”

Section 60 deals with the inspection of dairies and the powers to prohibit supply of milk. This section is almost identical with *Section 4* of the Infectious Disease (Prevention) Act, 1890, already referred to.

Section 61.—Under this section, the Local Authority may require any dairyman to whose milk supply any case of infectious disease is attributable, to supply a full and complete list of the names and addresses of his customers within a time specified ; and the Local Authority may also require any such dairyman to supply them with a list of the names and addresses of farmers, dairymen, or other parties from whom he receives or has within a specified time received milk.

We have already referred to the law in England with regard to stables and piggeries in Chapter IX. Under the Public Health (Scotland) Act, 1897, *Section 42*, powers are given Local Authorities for the periodic removal of manure from all stables and mews.

The law with regard to piggeries is found in *Section 16, subsection 4*, which states :—

“ (4) Any stable, byre, or other building in which any animal

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or animals are kept in such a manner or in such numbers as to be a nuisance or injurious to health.”

In the Act of 1867 the word “ pigstye ” was introduced after “ byre,” but it is evidently intended to be included in the general term, “ other building.”

Section 35 gives Local Authorities powers to make byelaws regulating, (1) the construction of pigstyes, (2) the places in which they may be erected, and (3) the mode of cleansing them at proper intervals so as to prevent them from becoming a nuisance or dangerous to public health.

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Chapter XI

OFFENSIVE TRADES AND LAWS RELATING TO SAME

It is enacted in the Public Health and other Acts that certain trades or businesses which are termed offensive must not be established within the district of an Urban Authority without the consent in writing of the said authority.

The types of businesses specified include blood-boiler, bone-boiler, fellmonger, soap-boiler, tallow-melter, tripe-boiler, or any other noxious or offensive trade, business, or manufacture.

Such businesses may be carried on with little or no nuisance, provided proper precautions are taken in dealing with and carrying on the process of manufacture.

It is essential that the student should have some knowledge of these businesses, no matter how slight ; it will, therefore, be expedient here to discuss the elements in the process of manufacture of offensive trades, so that we can the better deal with any complaint arising under this head.

It is quite true that we cannot go into the full details here, but we can certainly acquire a grip of the elementary facts with regard to the trade processes of such businesses, sufficient for all ordinary purposes.

Let us look, then, at these various trade processes, the nature of the nuisances which may arise from them, and the methods of abating such nuisances, together with the Local Government Board's Model Byelaws made in regard to offensive trades.

Blood-boiler.—Blood-boiling and drying is chiefly employed as one of the methods used in the manufacture of artificial manure. The blood is brought from slaughter-houses, knackers' yards, etc., for treatment, and is usually carried in metal drums or containers ; from these it is emptied into a large tank or vat, and while there is treated with steam discharged through movable pipes.

When sufficiently treated by steam, it is transferred to driers. These are usually large cylindrical vessels of iron which revolve inside a steam jacket and are fitted internally with a set of revolving arms which stir the contents steadily.

During this latter part of the process, the blood is reduced to a fine powder which has little or no smell, and in this form it is in its marketable state as artificial manure.

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Nuisances arise from the storage of the blood when received on the premises. To obviate this nuisance, the blood ought to be kept in tightly closed metallic vessels until required.

Nuisance may be created in the first part of the process when the blood is being treated by steam, or in the second process when in the driers. If the driers and steam vats are covered in, and the evolved gases carried away by tubes and treated in a manner described later in this chapter, this nuisance will be obviated.

Again, nuisance may arise from the unclean manner in which the premises and appliances are kept. This, of course, can be remedied by scrupulous cleanliness in every detail of the business and the premises themselves.

The Model Byelaws with respect to this business state that all blood received on the premises must be stored in such a manner and in such a position as to prevent the emission of noxious effluvia therefrom.

Every blood-boiler must adopt the best means of rendering harmless the vapours from any pan or other receptacle used, either by condensing such vapours or by burning them over a fire, or discharging them at a sufficient height.

In the Model Byelaws, the trade of a blood-boiler is kept separate from that of a blood-drier, but the byelaws with regard to both trades are practically identical.

Bone-boiler.—Bone-boiling is a process by means of which gelatine and fat are extracted from the bones by boiling. The bones are collected from slaughter-houses, knackers' yards, butchers' shops, etc., and after treatment the bones are used for the purpose of making fertilisers, buttons, and as a source for phosphorus.

The bones on arrival at the bone-boilers' premises are first sorted out, the longer and larger ones being cut into suitable sizes by sawing. They are then placed in what is known as a digester, and water added to them. This water, during the trade process, is under the pressure of its own steam, so that it can be raised to a higher temperature than boiling-point (212 degrees F.), at which it would boil under ordinary circumstances. After raising the temperature of the digester to the required temperature, and maintaining at this degree of heat for the requisite time, the contents are allowed to cool, when the fat and gelatine are drawn off.

Very often the bones arrive in a rancid condition to be boiled, and here nuisance will be created unless they are stored in suitable receptacles, so provided that offensive odours do not escape from them. Means ought also to be provided for carrying off all offensive vapours during the boiling process, thus obviating a nuisance from this source. The waste liquor left after the fat and gelatine

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have been removed may also give cause for offence if allowed to lie for any length of time or if poured into the drains before it is cooled. In addition to these, the general state of the premises requires supervision to see that they are at all times kept in a cleanly state.

The Model Byelaws with respect to this type of business stipulate that all bones received upon the premises must be stored in such a manner and such a situation that there shall be no emission of injurious effluvia therefrom.

All premises shall at the close of every working day be so cleansed that all grease, refuse, or filth which may have been spilled, splashed, or fallen, shall be removed.

The best practicable means of rendering harmless all vapour generated while boiling is being carried out must be adopted; moreover, all liquid waste must be cooled before being passed into any drain.

Fellmonger.—Fellmongering, to which should be added leather-dressing and tanning, deals with the trade process of treating hides and skins for commercial purposes. The fellmonger prepares the skins for the leather-dresser and the tanner. He may have to deal with "fresh" or "dry" skins—the former being the skins of animals killed locally, while "dry" skins are those which are imported.

In the case of fresh skins, they are beaten with mallets and soaked in water to render them soft, after which they are placed in pits which contain a solution of milk of lime. This latter part of the process calls for a double treatment, the skins being put first in a weak solution of milk of lime and then in a strong solution.

When taken from the pits, the skins are hung on frames either in a yard or in covered sheds, and in the case of sheep skins, the wool is picked off. When dry, the skins, known as "pelts," are ready for the leather-dresser.

The only difference in the treatment of "dry" skins from the foregoing, is that they require to be soaked in water for some time before commencing the process.

The leather-dresser, on receiving the skins or pelts, treats them to a process called liming, first by a weak solution, and then by a strong one, after which they are washed; this is followed by a treatment whereby they are "puered," i.e. treated with a preparation of dogs' dung, after which they are thoroughly washed with warm water.

They are then ready for the tanning pit, into which they are placed to soak with some suitable tanning agent such as sumach, oak bark, etc.

The tanner now carries through the process of tanning; the

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horns are removed, and the hides trimmed after undergoing a similar process to that carried out by the leather-dresser.

In this process, three solutions are used, each one being stronger than the preceding one.

On being taken from the tanning pits, the hides are dried, trimmed, and pressed.

Nuisances here may arise from the want of proper means for storing the skins, or from the accumulation of clippings, horns, and useless skins. These should be disposed of as quickly as possible, and receptacles for storing them should be provided. Waste lime ought to be removed periodically and as often as possible. Smells from liming, puering, and drying processes may give cause for offence unless these are carried out in a manner to cause all such effluvia to be carried off efficiently by good ventilation.

The premises, together with all tables, benches, knives, etc., should be kept clean at all times, and the floors thoroughly flushed with water at the close of each working day.

The Model Byelaws require proper provision for the storage of all skins, and in the case of skins unsuitable, by reason of decomposition, for treatment, they shall not be kept on the premises longer than is absolutely necessary. All premises have to be thoroughly cleansed at the close of every working day.

Proper provision has to be made for carrying off all noxious vapours or effluvia. All tanks and other receptacles, not being liming pits, are to be emptied each day, suitable vessels or receptacles being provided for receiving any filth from such tanks when being cleaned. All waste lime has to be put into covered receptacles and removed as speedily as possible. All floors and pavements must be kept at all times in a good state of repair and internal walls limewashed at least twice a year.

Soap-boiler.—This is the name given to the trade of soap-making, and while different methods are employed in connection with the various proprietary brands of the finished article on sale, the following general description is the process on which they are all founded.

The materials employed are fats and oils. The fats include, for coarser brands, the fats from slaughter-houses, which, while unfit for human food, are perfectly good for the manufacture of soap. Then we have “ rendered ” fats, i.e. those which have been treated by heat and the membranous matter removed, also “ kitchen stuffs ”—i.e. fat which requires rendering—and tallow.

Among the oils used are coconut, palm, olive, cottonseed, and certain fish oils.

In addition to these, we find other ingredients used which include caustic soda, caustic potash, crude soda ash (black ash),

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resin, silicate of soda (soluble glass), kaolin (Chinese clay), and sulphate of soda.

The first part of the process consists in rendering the "kitchen stuffs" or fats. This is done in covered pans or vats, and after all the fat has been extracted, the membranous matter is removed.

Certain of the oils used require to be bleached, in order to get them to a lighter colour for the brand required.

A ley is now formed by mixing caustic soda or caustic potash with water. If hard soap is to be made, caustic soda is employed in making the ley, while potash is used for soft soap. The leys may be of different strengths according to the nature of the fats or oils with which they are to be mixed.

The prepared fats, oils, and ley are now put into a large boiler where boiling takes place. These boilers are usually of cast iron or copper, set in brickwork, and the means of heating employed may be by steam from a steam jacket surrounding the boiler, steam passing direct into the boiler by means of steam pipes, or by a fire or flame applied to the bottom of the boiler.

During the boiling process, the oils and fats are, of course, decomposed into various fatty acids such as oleic, stearic, and palmitic. The soda or potash, by chemical action and combination with the fatty acids, sets up what is termed saponification. In other words, conversion into soap occurs, and the result is a substance which we term soap.

When the mixture has been boiled for the requisite time, what is termed "cutting the pan" is carried out; this simply consists of throwing common salt on the boiling mixture. This simple process causes the soap to separate from the other ingredients and rise to the top, from which it is run off and may be pressed into cakes, moulded in frames, or cut into bars (such as is found useful for domestic purposes). In the making of scented or coloured soaps, the necessary ingredients are added before the cakes are moulded.

The liquor left in the boiler after the soap has been drawn off is known as spent leys and contains a large percentage of glycerine, which is recovered for commercial purposes.

Nuisances in this class of trade usually arise from the storage of the raw materials, such as the fats, especially if any in a rancid condition are received. Proper storage will obviate any offence in this direction. Nuisance may also arise from the preparation of the ley, but proper care should prevent this. The boilers used should be covered in, and have tubes for carrying off all noxious and offensive vapours or fumes. Good ventilation and thorough cleanliness of the whole of the premises, together with the condensation of all evolved gases, will allow this class of trade to be

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conducted in a manner that will not readily give rise to complaints.

In dealing with this trade, the Model Byelaws require every soap-boiler to make proper provision for the storage of all materials used in connection with the business and for the adoption of the best practicable means of treating evolved gases or vapours so as to render them harmless.

Tallow-melters.—While discussing the trade of soap-boiler, we have stated that many of the fats received have to be rendered before they can be used in that class of business, but in many cases the fats are received ready for use, as they have already been treated by some one carrying on the business of a tallow or fat melter. In this type of trade, crude fats are treated, the products being the refined fat for soap-making, and tallow for candle-makers.

The source of supply of the crude fats is usually from slaughter-houses near to, or at a distance from, the tallow-melters' premises, and also imported fats. These fats on arrival are usually hung up for a time to allow them to dry thoroughly, after which they are passed through a mincing machine, either electric motor or steam driven.

The pans used for the purpose of rendering the fat are mostly of copper or iron, and should be provided with covers, or they may be built in ranges and hooded over, a tube or pipe conveying away the vapours and offensive odour.

The pans may be heated by a fire underneath them or steam jacketed—i.e. enclosed in a steam cylinder.

The fat, in its minced condition, is put into the pans, and a little water added to prevent scorching.

After thorough heating and cooking, the liquid fat or tallow is run off into casks, kegs, or barrels, and is then ready for disposal.

The residue, known in the trade as “greaves,” and which consists of the membraneous parts of the fats, is left behind and disposed of by burning or otherwise.

Nuisances in connection with this trade arise from the drying of the fats, which may be in a somewhat odorous condition, and in the storing of it after it is dried.

Both these types of nuisances may be got rid of by drying the fats in a chamber where there is a good strong draught or ventilation, and in having suitable covered receptacles for storing the dried fat until it is to be used.

Nuisance from the boiling process can be obviated by burning or condensing all evolved gases and vapours.

The cleanliness of the premises should also receive constant attention to prevent nuisance occurring, while, if the greaves are

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to be otherwise disposed of than by burning, suitable receptacles with close-fitting lids should be used for keeping them in, and they should not be allowed to accumulate.

With respect to this trade, the Model Byelaws state that :—

All raw materials must be stored in such a manner as not to create a nuisance, and that every tallow-melter shall at the close of every working day thoroughly cleanse his premises, while all internal walls shall be limewashed twice a year at least.

All floors and walls must be kept in a state of good repair, and the best practicable means must be adopted to render innocuous all vapour emitted from any pans.

Tripe-boiler.—This trade is carried on for the preparation of tripe for edible purposes, and consists of cleaning, cutting, and dressing the stomachs of sheep and cattle ready for cooking, and the boiling of the prepared tripe.

The stomachs are first emptied, cut into the necessary portions, then thoroughly cleansed, scraped, dressed, and trimmed.

The tripes are afterwards cooked, with added water, in boilers, after which they may be potted, or put into suitable receptacles and despatched for sale by retail.

Nuisance may arise from the stomachs being kept too long before being dressed. Nuisance also arises from the manure, garbage, and refuse matter from the stomachs, if not speedily dealt with.

Or the steam from the boiling process may be offensive unless all vapours thus evolved are carried off by tubes and condensed or burned. Again, all tubes, benches, knives, etc., used in the conduct of this type of business ought to be kept clean and washed as often as practicable, otherwise a nuisance may arise from them.

The whole premises ought to be kept thoroughly clean, and limewashed at least four times each year.

The Model Byelaws with respect to this business insist on :—The floors being thoroughly cleansed at the close of each working day. The thorough cleansing at the finish of each day's work, of all benches, tables, etc., while all dung, filth, etc., which may have been splashed on the internal walls, must be removed at the close of each day. Moreover, the premises must be limewashed at least four times each year. Proper receptacles, with close-fitting lids, are to be provided for the reception of all garbage, manure, filth, refuse, etc., and these are to be removed with all possible despatch ; and when not in use, the receptacles are to be kept clean. All floors and internal walls are to be kept in a state of good repair. The best practicable means to be provided for dealing with all vapours and gases from the boiling process

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is either by condensation, or by burning over a fire ; and the cooling of all liquid refuse, before discharging it into any drain, is also essential.

We have now discussed the offensive trades as enumerated in the Public Health Act, 1875, Section 112 ; but it is also stated in the said section, “ any other noxious or offensive trade, business, or manufacture ” ; so, for that reason, we will carry our observations a little farther, and take a few other trades which may easily be classed as offensive.

Glue-making.—This trade, which is allied to that of size-making, is carried on for the purpose of extracting gelatinous matters from certain trade refuse.

The trade refuse dealt with consists of hoofs, horns, ears, damaged hides and pelts, and cuttings from tanners, leather-dressers, and fellmongers.

The bulk of these matters comes from slaughter-houses, knackers’ yards, etc.

The raw material just described is first put into tanks or vats and soaked with a solution of milk of lime to remove all blood, grease, oil, and dirt, and when sufficiently cleansed, it is then boiled in water in large boilers until the whole mass gelatinises when cooled.

These boilers are heated in a similar manner to the boilers already described in dealing with other offensive trades.

When the mixture in the boilers has been boiled for a sufficient period, the heat is withdrawn and the mass allowed to stand for a time in order to allow any impurities and sediment to settle.

The liquid is then drawn off, and after being allowed to cool still further, it is cut into cakes, usually of oblong shape, and these are then placed in drying frames to harden.

The residue left in the boiler (known in the trade as “ scutch ”), is removed, and being of little further use, is put into bins or other suitable receptacles ready for removal with the other refuse ; or it may be taken away and burned.

This glue receives further treatment when it is desired to make “ size.” The hard cakes of glue are broken up and ground into a fine powder by a milling process, and this product is then put on the market as size.

In this class of business, nuisance may easily arise from the nature and storage of the raw materials used.

These ought to be stored in suitable receptacles and used as early as possible.

Then the tanks or vats used for containing the milk of lime, and in which the raw materials are soaked, may give rise to trouble unless such tanks are thoroughly cleansed as often as possible, and the residue from them speedily and effectively disposed of.

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Nuisance from the boiling process will not arise if proper precautions are taken to carry off all objectionable vapours and condensing all evolved gases. All "scutch" should be carefully and speedily removed after the liquid has been drawn off, otherwise nuisance will arise from this source. The drying loft or rooms should be well ventilated and kept thoroughly clean, while the whole premises should be kept at all times in a clean and fresh condition.

The Model Byelaws with respect to the trade of a glue-maker aim at the following :—

All raw, moist materials to be stored in such a position and manner as to prevent the emission of noxious effluvia therefrom. All "scutch" and other refuse or residue from pans and tanks to be put into suitable closed receptacles and removed with all possible dispatch. If the "scutch" or residue is placed in any shed or chamber on the premises, all the contents of such shed or chamber must be removed forty-eight hours after the deposit of the same in the shed or chamber. All floors and pavements are to be cleansed at the close of every working day, and all fragments of glue or anything used in connection with glue-making removed from the premises where boiling is carried on. All tanks, vats, or other receptacles used in connection with the premises and interior and exterior of all boiling pans to be thoroughly cleansed as often as necessary.

All waste lime from any pit on the premises to be removed with all possible dispatch. All floors and internal walls to be kept in a good state of repair, and the premises lime-washed periodically. The best practical means to be adopted for rendering innocuous all evolved gases and vapours.

Gut-scraping.—This trade is carried on in connection with the treatment of animals' intestines to prepare them for sausage casings, catgut, etc. The intestines are first soaked in tanks or troughs containing water, with a mixture called chloralum added to it. Here the guts remain until putrefaction has reached a stage when they are more easily treated in the process. The intestines are then taken to long wooden tables or benches, where all adhering pieces of fat, etc., are removed. The outer covering of the gut is now removed by scraping it with a blunt metal or wooden knife. When this is done, the guts are turned inside out and back again by means of a jet of water. After thorough rinsing and cleansing with water, the finished gut is packed ready for the sausage-maker, or sent to be spun into catgut.

Nuisance may easily arise from the guts (arriving to be treated), if they have been lying about for a time, especially in hot weather, and for this reason they ought to be kept in suitable

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receptacles and used as quickly as possible. Considerable trouble may arise from the soaking tanks unless these are well looked after. Most gut-scrapers use the substance already mentioned—namely, chloralum—which, besides having the power of greatly reducing smells, does not harm the intestines in any way.

By using chloralum, and seeing that the water is changed as frequently as possible, little nuisance should arise from this source. Next, there is the nuisance which may arise from the scraping process. This, however, may be kept in check by providing proper receptacles for such scrapings and waste matters, and having them removed as speedily as possible. The internal walls and floor of the premises should be kept clean. Lime-washing ought to be carried out periodically, and all floors, benches, knives, etc., should be thoroughly cleansed at the close of every working day.

The Model Byelaws here require that :—

All guts should be stored in such a manner as to prevent the emission of noxious odours. The floors of the premises to be flushed with water and some suitable deodorant several times a day, and the floor thoroughly cleansed at the close of every working day with water ; also all knives, benches, tables, tubs, or utensils to be cleansed at the end of each working day. All internal walls and ceilings to be limewashed four times, at least, in each year.

All floors and inside walls of premises must be kept in a state of good repair.

These are all the Byelaws made in connection with offensive trades, but there are still others which we may find it profitable to study, although no Model Byelaws are made respecting them.

Manufacture of Artificial Manure.—Probably no class of business has grown more rapidly during recent years in connection with land production than that of artificial manure.

All kinds of waste matters are brought forward for treatment for this purpose. Here, the various wastes from the different trades we have been discussing may be used up in a profitable manner. The process in this trade consists in mixing the various waste products with certain earthy salts, whereby compounds containing plant and vegetable food, such as potash, phosphorus, etc., are produced.

In connection with the manufacture of chemical manures, the following method or a modification of it, is usually employed.

All the miscellaneous waste and organic matters are stored in suitable receptacles when they arrive on the premises, and from these they are transferred to covered tanks and treated with steam. The idea of this part of the process is to break up and disintegrate, as far as possible, the various articles in the mass.

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When this action has taken place sufficiently, the mixture is transferred to driers of large design and somewhat similar in action to those already described in connection with the business of blood-boilers.

These driers are steam-jacketed, and have revolving arms fitted inside. Here, the mixture undergoes the second part of the process, when it is reduced to a dry powdery or caking mass.

Leaving the organic matters at this stage, let us turn our attention to the preparation of the other ingredients.

These consist of a mineral nature, the principal being phosphatic rock, either in the form of apatite, phosphorite, coprolites, or mineral phosphate and whatever mineral agent is selected; it is first crushed and reduced to a powder by milling or grinding.

Here, then, we have two kinds of powdered matters, one being organic and the other mineral. These are first mixed according to the strength of the agents required, and then put into a mechanical mixer. This mixer is covered and has a hopper attached to the top. When the power is applied, the powders inside the mixer are kept in constant movement by means of revolving arms inside the machine, and during the whole operation sulphuric acid is being slowly added from the hopper on top of the machine.

When this part of the process has been sufficiently carried out, the bottom of the mixer is opened and the contents fall direct into what is known as the "hot den," where they remain for a period sufficient to allow certain chemical changes to take place, and when these are completed the artificial manure is packed ready for the market.

Nuisance will arise in a business of this nature from many sources unless precautions are taken.

All the raw waste and organic materials require to be stored in such a manner so that nuisance will not arise from them. The steam treatment of the organic matters requires to be conducted in tanks or vats where provision is made for carrying off the evolved vapours, and a similar arrangement requires to be made with regard to the mixers and hot dens. Attention must also be paid to the general cleanliness of the premises and the regular cleansing and limewashing of all interiors.

Knacker.—A knacker is one who slaughters horses and other animals, the flesh of which is not intended for human food. The trade is undoubtedly one which is offensive.

Many of the animals and carcasses received are already diseased, while they often accumulate on the premises quicker than they can be disposed of. Again, many knackers boil up certain parts of the carcasses for cats' meat, etc., and in this connection nuisance often occurs.

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In connection with this class of business (which ought only to be established out in the open country) one can only by constant supervision and insistence on the cleanliness of premises, periodic lime-washing, proper drainage, the liberal use of deodorants or disinfectants, and the speedy and regular removal of all matters, whether products or waste, hope to keep such businesses in such a manner as will minimise the possibility of nuisance and offence.

Brick-burning.—This type of business is not very common, but where found it is usually carried on by burning the bricks in “ clamps.”

The heat provided is usually generated by burning any old matter and house refuse from any neighbouring town, and it is here that nuisance arises.

The remedy lies, obviously, in either not allowing the trade to be established near a town, or by prohibiting the use of house refuse for this purpose.

Fish-frying.—This class of business, which is found in most, if not all, of our towns and cities, can easily give rise to nuisance, and this is due in no small measure to the fact that cottonseed oil is so largely used in the cooking process.

When heat is applied to this oil, it decomposes readily and liberates a very offensive vapour called acrolein.

This nuisance is, however, easily abated by enforcing the erection of a hood over the stove or range ; in the funnel of this hood a gas jet is kept burning, and this will conduct the fumes to the flue, thus carrying them off.

In this chapter much has been written regarding the condensation of evolved gases ; we will, therefore, look at some of the methods employed in this connection.

1. Absorption by Water.—A large conical chamber is erected, and the evolved gases and vapours are conducted by tubes to the lower end of it, where they are allowed to pass upwards. At the top of the chamber is a water sprayer, and the gases passing up the chamber are arrested by this fine spray, which absorbs large quantities of the gases or chemicals contained in the vapours. The water, on reaching the bottom, is drawn off, and in some cases treated for the recovery of certain chemicals it contains. For this reason, this type of condenser is often favoured in chemical works.

2. Absorption by Solids.—Here we have a large cylindrical vessel shaped somewhat like a tower and packed with coke which is kept moist by a trickle of water from a tap at the top of the tower. This apparatus is known as a *coke scrubber*, and the gases are conducted to it in a similar manner to that just described, only in this case the gases or vapours should be cooled. Now, this may be done by passing the tubing carrying the gases through a tank

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containing cold water. The gases enter at the bottom of the scrubber, and making their way upward, they are arrested by the moistened coke and the noxious fumes "fixed." At certain intervals, the scrubber is emptied and its contents burned, fresh coke being put in to take its place.

3. Destruction of Gases by Heat.—This may easily be said to be the best and most satisfactory method of dealing with the gases. The vapours are carried along as before, and are made to discharge into a furnace where the decomposition and destruction of offensive vapours is quickly accomplished.

In some cases, it is considered sufficient to simply carry all vapours, gases, or fumes away by means of piping to a considerable height above the ground and discharge them there, where they are diffused in the atmosphere.

Should a tall chimney-stack be used in connection with the premises, these vapours, gases, or fumes may be discharged into it, but they must on no account be discharged in such a fashion or at such a height as would result in any nuisance being committed.

In other places, one very often finds a combination of two of these methods, such as the vapour, etc., being first treated, say, in a coke scrubber, and the fumes afterwards discharged into a furnace.

A statement is often made that offensive trades are usually healthy trades, but one has only to remember that much of the material dealt with is in a more or less putrefactive state, full of micro-organisms, and we have yet to learn that such matter is beneficial to health. Again, in those trades which are mostly chemical, one has only to keep in mind that many of the gases are of a dangerous nature, such as sulphur dioxide, oxide of nitrogen, etc., and if present in a concentrated form would cause fatal injury.

As to the legal aspect of this phase of sanitation, we have only so far dealt with the Model Byelaws issued by the Local Government Board with respect to offensive trades.

These byelaws are issued under Section 113 of the **Public Health Act, 1875.**

Section 112 of this Act is very important. We will therefore take it here in full, viz. :—

"112. Any person who, after the passing of this Act, establishes within the district of an urban authority, without their consent in writing, any offensive trade ; that is to say, the trade of—

Blood-boiler, or
Bone-boiler, or
Fellmonger, or

Soap-boiler, or
Tallow-melter, or
Tripe-boiler, or

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any other noxious or offensive trade, business, or manufacture, shall be liable to a penalty not exceeding fifty pounds in respect of the establishment thereof, and any person carrying on a business so established shall be liable to a penalty not exceeding forty shillings for every day on which the offence is continued, whether there has or has not been any conviction in respect of the establishment thereof.”

It will be noted that the powers of this section are vested in Urban Authorities, but Rural Authorities may avail themselves of its provisions by applying for powers in the manner stated in Section 276 of this Act.

As we have seen, Section 113 gives power to Local Authorities for the framing of byelaws with respect to offensive trades.

Section 114 is as follows :—

“ Where any candle-house, melting-house, melting-place, or soap-house, or any slaughter-house, or any building or place for boiling offal or blood, or for boiling, burning, or crushing bones, or any manufactory, building, or place used for any trade process or manufacture causing effluvia, is certified to any urban authority by their medical officer of health, or by any two legally qualified medical practitioners, or by any ten inhabitants of the district of such urban authority, to be a nuisance or injurious to the health of any of the inhabitants of the district, such urban authority shall direct complaint to be made before a justice who may summon the person by or on whose behalf the trade so complained of is carried on, to appear before a court of summary jurisdiction.

“ The court shall inquire into the complaint, and if it appears to the court that the business carried on by the person complained of is a nuisance, or causes any effluvia which is a nuisance or injurious to the health of any of the inhabitants of the district, and unless it is shown that such person has used the best practicable means for abating such nuisance, or preventing or counteracting such effluvia, the person so offending (being the owner or occupier of the premises, or being a foreman or other person employed by such owner or occupier), shall be liable to a penalty not exceeding five pounds nor less than forty shillings, and on a second and any subsequent conviction, to a penalty double the amount of the penalty imposed for the last preceding conviction, but the highest amount of such penalty shall not in any case exceed the sum of two hundred pounds.

“ Provided that the court may suspend its final determination on condition that the person complained of undertakes to adopt, within a reasonable time, such means as the court may deem to be practicable, and order to be carried into effect for abating such nuisance, or mitigating or preventing the injurious

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effects of such effluvia, or if such person gives notice of appeal to the court of quarter sessions in manner provided by this Act.

“Any urban authority may, if they think fit, on such certificate as is in the section mentioned, cause to be taken any proceedings in any superior court of law or equity against any person in respect of the matters alleged in such certificate.”

By *Section 115* the urban authority may take action with respect to any offensive trade outwith their district should complaint be made to them, but the case must be heard in the district in which the alleged complaint arises.

The law with regard to offensive trades in Scotland will be found in the Public Health (Scotland) Act, 1897, *Section 32*, viz. :—

“(1) If any person after the commencement of this Act establishes, without the sanction of the local authority, the following businesses or any of them; that is to say, the business of blood-boiler, bone-boiler, manure manufacturer, soap-boiler, tallow-melter, knacker, tanner, tripe-boiler, gut or tripe cleaner, skinner or hide factor, slaughterer of cattle or horses, or any other business which the local authority may declare, by order published in the *Edinburgh Gazette*, to be an offensive business, he shall be liable to a fine not exceeding fifty pounds in respect of the establishment thereof, and any person carrying on the same after a conviction for the establishment thereof shall be liable to a penalty not exceeding twenty-five pounds for every day during which he so carries on the same.”

It will be seen that in this section the list of offensive trades given is more comprehensive than that given in *Section 112* of the English Public Health Act.

“(2) The local authority shall give their sanction by order, but at least fourteen days before making any such order, shall make public the application for it, by advertisement in one or more local newspapers, or by the posting of handbills in the locality, setting forth the time and place at which they will be willing to hear all persons objecting to the order, and they shall consider any objections made at that time and place, and shall grant or withhold their sanction as they think expedient, and where the local authority grants or withholds such sanction, any person aggrieved may appeal to the Board (N.B.—Local Government Board), whose decision shall be final, but in case of a district other than a burgh, the appeal to the Board shall only arise after the county council has given its determination on the matter, and a local authority may appeal to the Board against the determination of the county council.

“(3) The local authority may make byelaws for regulating the conduct of any businesses within the meaning of this section

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and of section thirty-seven of this Act, which are for the time being lawfully carried on in their district, and the structure of the premises in which any such businesses are being carried on, in order to prevent or diminish the noxious or injurious effect thereof, and the mode in which the said application is to be made.”

Section 37, referred to in this subsection, applies to the provision as to nuisance created by Local Authority in dealing with refuse.

The making, publication, and confirmation, etc., of these byelaws come within the scope of Sections 183 to 187 of this Act.

Subsections 4 and 5 of this section deal with the penalties which may be inflicted on any person violating the terms of the section or byelaws made thereunder.

“(6) For the purpose of this section, a business shall be deemed to be established after the commencement of this Act not only if it is established newly, but also if it is removed from any one set of premises to any other premises, or if it is renewed on the same set of premises after having been discontinued for a period of twelve months or upwards, or if any premises on which it is for the time being carried on are enlarged without the sanction of the local authority ; but a business shall not be deemed to be established anew on any premises by reason only that the ownership or occupancy of such premises is wholly or partly changed, or that the building in which it is established, having been wholly or partially pulled down, or burned down, has been reconstructed without any extension of its area.”

In addition to the sections just quoted, we might also take the following :—

Public Health Act, 1875 (England), Section 91, subsection 6.—
“Any factory, workshop, or workplace (not already under the operation of any general Act for the regulation of factories or bakehouses), not kept in a cleanly state, or not ventilated in such a manner as to render harmless, as far as practicable, any gases, vapours, dust, or other impurities generated in the course of work carried on therein that are a nuisance or injurious to health ” ; and

Public Health (Scotland) Act, 1897, Section 16, subsection 6.—
“Any work, manufactory, trade, or business, injurious to the health of the neighbourhood, or so conducted as to be injurious or dangerous to health, or any collection of rags or bones injurious or dangerous to health.”

Such, then, are the principal enactments under which Local Authorities can deal with offensive trades.

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Chapter XII

COMMON LODGING-HOUSES

AMONG the many duties which may be assigned to the sanitary inspector is that of inspector of common lodging-houses, a duty which is at times far from pleasant.

Common lodging-houses have already been described, and these may truthfully be said to be that class of lodging-house in which persons of the poorer classes are received for short periods, and, though strangers to one another, are allowed to inhabit one common room.

Common lodging-houses vary a good deal in type of premises and inhabitant, according to the district which they serve, and it is worthy of note that many enterprising local authorities have erected, maintained, and managed successfully houses of this description.

Where municipal enterprise has not extended in this direction, private enterprise has, in many cases, been the means of erecting and carrying on well-equipped houses.

There is a third type of common lodging-house, however, and it is this type which calls for the constant attention and supervision of the sanitary inspector ; thus, when old buildings which have served possibly as tenements, or some such useful purpose, are converted into common lodging-houses.

With respect to the first two types mentioned above, the inspector, as a rule, has very little trouble. These houses are usually new buildings erected to plans which have been passed by the officials of the Local Authority, and carried out, for the most part, under the supervision of the inspectors of such Local Authority. When completed and occupied, this type of house generally attracts the best class of lodgers ; indeed, it is not uncommon to meet lodgers in these houses who are tradesmen in steady employment, and who, for reasons of their own, have lived in the one house for years. We will take a typical example, thus giving a general idea of how these houses are arranged internally.

The building proper consists of a basement, ground floor, and two, three, or more storeys.

In the basement, we find the boiler and plant for the heating arrangements and for supplying hot water throughout the house. Here also we find the laundry with washing-machines, hydro-

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extractors, and drying frames for dealing with the washing of the clothing and bed-clothes of the establishment. On this floor also may be found baths for the use of the inmates, while wash-hand basins in ranges, together with water-closet and urinal accommodation, may be provided.

On the first floor are the superintendent's offices and a large day room, used by the inmates for reading and recreation. Then we have the kitchen, usually a large, roomy apartment, fitted with heavy tables and forms, while around the walls are fixtures known as lockers, a locker being apportioned to each lodger, in which to keep food or any small articles. A large hot plate is provided at one end of the kitchen for the use of the lodgers in preparing their food ; this hot plate may be heated by steam or by a coal fire. An abundant supply of hot and cold water is provided, with tubs and sinks, so that all dishes used may be easily and quickly cleansed.

In dealing with these kitchens and day rooms, it may be necessary here to point out that lodgers are not allowed in those parts of the house which are kept for sleeping purposes during the day. Where there are lodgers whose work takes them out through the night, and who, as a consequence, must sleep during the day, provision must be made by the keeper of the lodging-house (by permission of the sanitary inspector) to put aside part of the building for that purpose.

Urinal and water-closet accommodation should also be provided on this floor.

In addition, many common lodging-houses run a small shop or store where bread, tinned meat, tea, condensed milk, sugar, and such-like commodities may be obtained by the lodgers.

The upper floors are devoted to sleeping accommodation.

In some cases, these flats are divided into large dormitories, while, in others, they are laid out in small rooms, say for four to eight beds. In yet a third type, the floors are divided into cubicles. These cubicles are made by erecting partitions 6 to 7 feet high and fully 6 feet long. They are about 4 feet 6 inches in breadth for single cubicles, and 7 feet in breadth for double ones. These small apartments are covered on top by wire netting, and as each cubicle, whether single or double, is fitted with a door which has a lock and keys, a certain amount of privacy is obtained, which is evidently much appreciated by a section of the frequenters of these houses.

Water-closet and urinal accommodation ought to be provided on each floor for the use of the lodgers.

The top floor is usually devoted to the accommodation of the staff engaged in working the house, while the house of the

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keeper or superintendent is usually taken off one of the floors, and has a separate entrance to it other than the entrance to the lodging-house proper, although a door leading into the lodging-house direct from the keeper's house ought to be provided for convenience.

The drainage for the whole house should be good, and all joints, pipes, and sanitary fittings ought to be of good type and pattern, and the workmanship of the best.

The beds provided are usually of the hospital type, i.e. 6 feet by 2 feet 6 inches, with spring bottom and fibre or hair mattress, two blankets, sheets, pillow and pillow-case, and coverlet. The sheets and pillow-case require to be washed regularly. For the information of those who have no knowledge of the habits of some of the lodgers who frequent common lodging-houses, it might be as well to state that those responsible for the management of these places have much to put up with. Some lodgers will do almost anything rather than wash their faces or hands, and will certainly not avail themselves of the use of a bath. The result is that they are far from being in a cleanly state, and a clean bed will look the next day as if it had been used for weeks on end without changing. Again, we have the man who earns his living as a coal-heaver, or by some other dusty and dirty occupation, and who also shirks washing, although he probably will give his face a "wipe" after tea; thus, he goes to bed with all the grime and dust about him, and, as a consequence, the bedding, when he leaves it, requires changing. But by far the worst type of lodger with whom the management have to deal, is the man who, because of some physical weakness or perfected laziness—destroys a bed and bedding in one night's use. In the first two cases, those responsible can pick out their men; but it requires experience, and incidentally damage, before the latter type of lodger is located.

We will now discuss the third type of common lodging-house in use, where an old property is converted for this purpose.

Intimation must be given to the Local Authority one month before such premises are to be occupied, and the sanitary inspector visits and inspects the property, and duly submits his report, which we will now analyse. Thus, on arrival at the property, the inspector should first note the general features of same, the number of storeys, and as to whether it is to be entirely used for a common lodging-house, or only partly so; also the surroundings and proximity of other buildings. In addition, approaches—whether paved or not—the condition of roofs, rones, rain-water conductors, external walls, windows, whether waste and rain-water pipes are trapped, and the position and condition of soil-pipes, etc., should all be noted.

The drainage should next be examined, and if considered

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necessary, a test applied, not only to it, but to the sanitation fittings.

It should also be noted if drainage is of old or recent construction, and if of fireclay or iron, whether inspection chambers are interposed in its length, and where and whether the drain itself is disconnected from the sewer by a proper disconnecting trap or not.

The internal arrangements should now be inspected. The staircase, if any, should be examined for faulty steps, broken plaster, or broken woodwork, and the same attention paid to the landings.

The situation and method of water supply should also be noted, and the nature of sinks—whether of iron or glazed fireclay—examined, together with the method of trapping and fitting.

The water-closet and urinal accommodation, their type, flushing appliance, situation, and how the apartments in which they are situated are lit and ventilated, must now be inspected. It should also be noted as to whether they are easily accessible or otherwise.

If tanks or cisterns are required for the storage of the water supply, these ought to be seen and inspected, and a note taken of their situation, of what they are constructed, and if of a type admissible, and as to the water supply from them to the water-closets being indirect, as essential under byelaws.

Next, the rooms proposed to be used for sleeping purposes are inspected, and each measured to find the cubic capacity, in order to regulate how many lodgers may sleep therein.

The floors should be examined to see that the boarding is sound ; also, the walls as to broken plaster. The windows require special attention as to whether they are sash windows or otherwise, and if made to open or not. Fixed windows are not permissible, and the size of each window ought to be taken. Should there be a fireplace in the room, it is well to have a ventilating plate put into the brickwork to the flue, near the top, to act as an outlet ventilator.

While in the room, it ought to be noted whether it is well lit or otherwise. This procedure of following with each room in turn, proposed to be used for sleeping purposes, and a note kept of the number of rooms intended for this purpose, should be adopted.

Our next attention must be paid to that part of the house proposed to be used as the lodgers' kitchen, etc. Its situation and condition as regards windows, floors, and walls are to be noted, and whether well lit and adaptable for easy ventilation or otherwise ; also the heating method to be employed (whether by stove

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or hot plate) for the benefit of the lodgers preparing their food. It is, moreover, of importance to pay particular attention to the means provided for washing dishes, pots, etc. The nature of the fittings, tubs, waste-pipes, traps, etc., and whether hot as well as cold water is laid on to these conveniences, are also matters of importance to jot down.

Then our attention is necessary as to the provision made for laundry purposes, both for the lodgers and the house itself; while it should be ascertained if baths and wash-hand basins are to be provided, and, if so, their situation and nature should be noted.

Provision will have to be made for the refuse from the house, and the situation of the ashbins, and the times of removal of refuse should be stated.

We now come to a very important point, and that is whether the common lodging-house is to be used exclusively for male lodgers, for female lodgers, or for both.

If it is proposed to accommodate members of both sexes as lodgers, it must be seen that provision for the separation of the sexes is properly carried out, and that the house is so divided that male lodgers do not have access to the sleeping quarters of the females, and *vice versa*, while it is always preferable to have two separate kitchens—one for males and one for females.

On these particulars being completed, the inspector draws up his report, which is submitted to the Local Authority for consideration along with the application submitted by the person applying to be registered as a keeper of a common lodging-house.

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Chapter XIII

HOUSES LET IN LODGINGS, AND CELLAR DWELLINGS

ALMOST every one is familiar with the notice bearing the inscription “ Apartments ” in the window or at the entrance to houses in the localities usually occupied by the tradesmen part of a town, but few are aware that it is part of the sanitary inspector’s duties to keep a register of all such houses, together with the sizes of the rooms let out for the purpose of accommodating lodgers, and to make periodic visits to or inspections of all such houses.

Further, the sanitary inspector will grant a certificate to any person who complies with the requirements in this direction ; and it may here be pointed out that it is an offence against the health enactments for any person to keep lodgers unless so registered by the sanitary inspector to do so.

The procedure here is very simple. The applicant fills in an application form, or applies to be registered as a keeper of a house let in lodgings, and on receipt of this application, the sanitary inspector will inspect the house, measure up each room in turn to find its cubical contents, take the sizes of the windows, and note the type of same and how far they can open. He will then be able to state how many persons may be allowed to sleep in each room without overcrowding taking place. The inspector will also note the situation and type of water-closet and other sanitary arrangements, and the situation of the house for which the application is made.

Houses let in lodgings are usually let by the week or month to boarders or lodgers, and as a general rule give little trouble to the inspector.

Local Authorities are empowered to make byelaws and regulations dealing with this type of business ; these we will take in the next chapter.

Cellar Dwellings also call for the attention of the inspector. A list of those within his district should be kept, and the premises visited periodically.

Houses in cellars are illegal unless they comply with certain requirements. Thus, if let as houses at the time of the passing

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of the Public Health Act, 1875, they must be at least 7 feet in height from floor to ceiling in every part, and there must be at least 3 feet of this height above the level of the street or adjoining ground. There must also be a space or area 2 feet 6 inches wide, extending along the whole frontage of the house and at least 6 inches deeper than the floor level.

The cellar itself must be efficiently drained, and the highest part of such drain at least a foot below the level of the floor. Again, the use of a water-closet, earth-closet, or privy, and an ashpit, must be provided for the cellar occupants' accommodation, while the house must be provided with a proper chimney and fireplace; and with regard to this type of house, there must be, in all front rooms at least, a window made to open, and having a glass area, clear of the frame, of 9 superficial feet. Such window should open to one half its size.

Where steps are necessary for entering such houses, they should not be over or against any window, while a clear space of 6 inches should be allowed between every part of the steps and the external walls of such cellar dwelling.

In Scotland these houses are known as "underground dwellings," and differ slightly from the foregoing requirements.

Thus, the building must have one of its external sides above the level of the adjoining ground, and must have a window in such side. Again, the height of rooms so used must be 8 feet, if built before the passing of the Public Health (Scotland) Act, 1897, and if built after the passing of that measure, the height from floor to ceiling must be at least 9 feet; 3 feet of this height to be above the level of the adjoining street or ground.

If the house has been built since 1897, any back room let along with a front room must be provided with some means of ventilation. In other respects the requirements are the same as those prescribed for cellar dwellings.

Farmed-out Houses are those which are let furnished to parties desiring accommodation. The usual method is that some one takes a building or part of a building on lease and furnishes the rooms, then lets them out by the day, week, or month. In the poorer quarters of our large towns, there is much to be said against a system like this being carried on, but the sanitary inspector is only concerned with the enforcing of the laws relating to health with regard to these, as to other houses.

While the legal aspect of this subject is dealt with in the next chapter, it will be to our advantage to take here the Model Byelaws of the Local Government Board with respect to houses let in lodgings, as by so doing we may avoid confusion with the byelaws made for common lodging-houses.

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Briefly, the following is a summary of the byelaws with respect to houses let in lodgings :—

3. There should be free air space in the rooms of such houses equivalent to 300 cubic feet for each person over ten years of age, and 150 cubic feet of free air space for every person under ten years of age, where the room is used exclusively for sleeping purposes.

4. Where a room in a lodging-house is not used exclusively for sleeping purposes, the free air space per person should be equal to 400 cubic feet for those over ten years, and 200 cubic feet of air space for those under ten years of age.

7. The landlord of a lodging-house shall furnish a true statement to the Council of the following particulars :—

- (a) Total number of rooms in the house ;
- (b) Total number of rooms let in lodgings or occupied by members of more than one family ;
- (c) The manner of use of each room ;
- (d) The number, age, and sex of the occupants of each room used for sleeping ;
- (e) The Christian name and surname of the lessee of each room ;
- (f) The amount of rent or charge payable by each lessee.

8-9. The landlord or whoever has charge of the house shall afford free access at all times to the medical officer of health, inspector of nuisances, or surveyor of the Council, for the purpose of inspecting the premises.

10-11. Having been admitted to the premises, all assistance must be given by persons responsible for the management of the house to the medical officer of health, inspector of nuisances, or surveyor, in carrying out inspections.

12. Landlord must provide water-closet or privy accommodation according to the maximum number of lodgers in the house, the proportion being not less than one water-closet, earth-closet, or privy to every twelve persons.

16-17. All courts, courtyards, areas, or other open space within the curtilage of the premises must be kept in a clean and wholesome condition.

18. All parts of a water-closet belonging to a lodging-house, together with the apparatus and drainage of same, to be kept at all times in a state of good action and repair.

19. All parts of any earth-closet or privy to be kept in a state of good repair, and the frequent application of dry earth or other deodorising substance to any filth deposited therein.

20. The pan, seat, floor, and walls of any water-closet, earth-closet, or privy to be thoroughly cleansed from time to time, and

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as often as necessary to keep same in a clean and wholesome condition.

24-26. The landlord shall cause every part of the ashpit used in connection with the house to be kept in good order.

27. A lodger in a lodging-house, or an occupant of any room therein, shall not throw any filth or wet refuse into any ashpit constructed and intended for the use only of ashes, dust, and dry refuse.

28. Every floor in a lodging-house to be swept at least once every day, and washed at least once every week.

29. Every window, fixture, or fitting of wood, stone, or metal, and every painted surface in every room, to be thoroughly cleansed as often as is necessary.

30. All liquid filth or refuse to be removed once at least in every day from every room of the lodging-house.

31-32. All landings and staircases of every lodging-house to be cleansed from time to time as often as is necessary.

33. No animal to be kept in any room or elsewhere on the premises of a lodging-house as to render the condition of these filthy or unwholesome.

34-35. Where a cistern or other receptacle exists in a lodging-house for the storage of water, the interior of the same shall be thoroughly cleansed from time to time in order to ensure keeping the same in a clean and wholesome condition.

36. All means of ventilation in any rooms, passages, or water-closets, earth-closets or privies in connection with a lodging-house, to be maintained at all times in good order.

37. All walls of any area, ceilings, interior surfaces of rooms, staircase or passages, and passages on the premises, to be periodically limewashed or painted as often as necessary to keep the premises in a cleanly and wholesome condition.

38. Where there is a court or courtyard used in connection with a lodging-house, such court or courtyard shall be paved with a hard, durable, and impervious pavement, evenly laid on a bed of good concrete, and sloped to a properly constructed channel leading to a trapped gully grating, which shall be so constructed and placed to carry off all rain or waste water from the court or courtyard.

39. All windows in rooms shall be kept open for at least one hour in the forenoon, and one hour in the afternoon, unless the state of the weather prevents it, or because any bed is occupied by any sick person, or for some other sufficient cause.

40-41. The landlord must, as soon as he is aware, immediately notify the medical officer of health, in writing, of the existence in such house of any case of infectious disease.

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42. Where, either by order of a justice or otherwise, any person is removed from a lodging-house suffering from any dangerous infectious disease, the landlord or lodger in charge shall do all that is necessary to assist in the removal of the patient and adopt all precautions in accordance with any instructions received from the medical officer of health suitable for the circumstances.

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Chapter XIV

LAW RELATING TO COMMON LODGING-HOUSES, HOUSES LET IN LODGINGS, ETC.

IN *Section 76* of the **Public Health Act, 1875**, it is laid down that every Local Authority shall keep a register in which shall be entered the names and residences of the keepers of common lodging-houses and the situation of the lodging-house, together with the number of lodgers authorised to be kept therein.

A copy of this entry shall be accepted in any court as a true copy if certified by the clerk to the Authority, while a copy must be supplied gratis to any one applying at a reasonable time for the same.

By *Section 77*, no one except the registered keeper of a common lodging-house shall keep such a house. Should the keeper die, his widow or any member of his family may apply for registration, and a period of four weeks is allowed, after the death of the keeper, for this purpose.

Under *Section 78*, a house shall not be registered as a common lodging-house until it has been inspected and approved by an officer of the Local Authority, while the Local Authority may refuse to register as the keeper of a common lodging-house any person who does not produce a suitable certificate of character signed by three inhabitant householders.

Section 79 stipulates that the keeper of a common lodging-house shall, if required, affix and keep undefaced and legible a notice with the words "Registered Common Lodging-house" in some conspicuous place outside the house. A penalty is inflicted on conviction, should the keeper fail to comply with a written request from the Local Authority to do so.

Local Authorities are empowered under *Section 80* to make byelaws in respect to common lodging-houses for :—

- " (1) Fixing, and from time to time varying, the number of lodgers who may be received into a common lodging-house, and for the separation of the sexes therein ; and
- " (2) For promoting cleanliness and ventilation in such houses ; and
- " (3) For the giving of notices and the taking of precautions in the case of any infectious disease ; and
- " (4) Generally for the well ordering of such houses."

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In the event of a common lodging-house being without a proper supply of water for the lodgers, the Local Authority may, under *Section 81*, by notice in writing, require a water supply to be provided, and if the terms of such notice are not complied with, the Local Authority have power to remove such house from their register of common lodging-houses.

All walls and ceilings of common lodging-houses shall be limewashed twice a year—i.e. in the first week of the months of April and October—in terms of *Section 82*; and failing compliance with this section, the keeper shall be liable to a penalty not exceeding forty shillings.

Should the Local Authority require lists of vagrants or beggars frequenting any lodging-house, they may obtain them by a request in writing to the keeper of the house, such keeper to state fully the name and other particulars of every person who resorted to such house during the preceding day and night. For this purpose the Local Authority shall supply schedules which the keeper shall fill in. (*Vide Section 83.*)

Where a person in a common lodging-house is ill of fever or any infectious disease, the keeper must, in accordance with the terms of *Section 84*, give immediate notice to the medical officer of health, and also to the poor-law relieving officer of the union or parish where such house is situated.

By *Section 85* the keeper or other person responsible for the management of a common lodging-house must give free access to such house, or any part thereof, to any officer of the Local Authority. Failure to do so entails a penalty of five pounds.

Under *Section 86*, it is an offence for the keeper of a common lodging-house who—

- “ (1) Receives any lodger in such house without the same being registered under this Act; or
- “ (2) Fails to make a report, after he has been furnished by the Local Authority with schedules for the purpose, in pursuance of this Act, of the persons resorting to such house; or
- “ (3) Fails to give the notice required by this Act where any person has been confined to his bed in such house by fever or other infectious disease.”

Should a keeper of a common lodging-house be convicted of a third offence against the provisions of this Act, the Court may adjudge that such keeper shall not keep a lodging-house during a period up to five years. The time laid down to be at the discretion of the Court, as laid down in *Section 88*.

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Section 89 gives the interpretation of a common lodging-house as follows :—

“For the purposes of this Act, the expression ‘common lodging-house’ includes, in any case in which only part of a house is used as a common lodging-house, the part so used of such house.”

With regard to **Scotland**, the law relating to common lodging-houses is found in *Sections 89 to 100, Public Health (Scotland) Act, 1897*, of which the following is a short summary :—

Section 89. All keepers of common lodging-houses to be registered in a register kept for the purpose by the Local Authority. Particulars of situation of house, number of lodgers authorised to be kept in the house, and in each apartment thereof, to be noted. All keepers to apply for renewal of licence to the Local Authority on the fifteenth day of May in each year. Local Authority may refuse to register a house for this purpose, if they consider it unsuitable, and may also refuse to register any person who does not produce a certificate of character in such form as the Authority direct. The Local Authority may, from time to time, with the approval of the Local Government Board, raise or diminish the sum payable per night, but so as not to exceed sixpence per night.

Section 90. Before a house can be used as a common lodging-house, it must previously have been inspected by the inspector of common lodging-houses of the district, approved and registered by the Local Authority.

If in the opinion of the Local Authority any common lodging-house, or any keeper thereof, shall cease to be suitable for the purpose, they may present a petition to the sheriff for authority to remove such house from the register either permanently or until there is a change of circumstances.

Section 92 empowers Local Authorities to make byelaws respecting common lodging-houses, with regard to the keeping and well ordering of them, separation of the sexes, fixing the number of lodgers who may be received therein, and also in each room, for enforcing sufficient privy or water-closet accommodation, for proper drainage and ashpits, and for promoting cleanliness and ventilation in such houses, and also with regard to the inspection of the houses and the conditions and restrictions under which inspections may be made.

Section 93 provides that where byelaws have been made by Local Authorities and confirmed, they shall be printed and supplied gratis to every keeper of a common lodging-house ; and such keepers shall be bound to keep a copy of such byelaws hung up in some conspicuous place in each room where lodgers are received.

Section 94 gives Local Authorities power to require a proper

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water supply to be provided for the use of a common lodging-house, and also sufficient privy or water-closet accommodation to be provided for the use of the lodgers therein. Until the terms of the Local Authorities' notice are complied with, the house may be removed from the register as a common lodging-house.

Section 95. The Local Authority may require the keeper of a common lodging-house to furnish particulars of all persons who resorted to such house during the preceding day or night, and for this purpose the Local Authority shall supply schedules to the keepers.

Section 96 gives Local Authorities power to remove persons suffering from infectious disease in any common lodging-house to hospital, but if removal be considered dangerous to the life of the patient, no lodger shall be admitted to such lodging-house until it is free of infection, and the Local Authority shall cause any clothes or bedding to be disinfected or destroyed.

Section 97 makes it the duty of the lodging-house keeper to immediately notify the medical officer of health or inspector of common lodging-houses of any case of infectious disease in the house; and if the medical officer considers the patient not fit to be removed, such premises shall not be used as a common lodging-house until declared free of infection, and the Local Authority may make provision for the temporary shelter or accommodation for the persons prevented from returning to such house.

Section 98 requires the keeper of a common lodging-house to give free access at all times to such house or part thereof to an officer of the Local Authority.

Section 99. All rooms, passages, stairs, floors, windows, doors, walls, ceilings, water-closets, earth-closets, privies, ashpits, cess-pools, and drains thereof shall be kept by the keeper of a common lodging-house to the satisfaction of the inspector; while he shall also limewash the walls and ceilings of the rooms in the first week of the months of April and October every year.

Section 100. Where a keeper is convicted of a third offence under this Act, it shall be adjudged part of the penalty that he shall not at any time within five years, or a shorter period, keep, or act in the care or management of, a common lodging-house.

In *Section 3* of the Public Health (Scotland) Act, 1897, we have the following definitions :—

“ The expression ‘ common lodging-house ’ means a house, or part thereof, where lodgers are housed at an amount not exceeding fourpence a night, or such other sum as shall be fixed under the provisions of this Act for each person, whether the same be payable nightly or weekly, or for any period not longer than a fortnight, and shall include any place where emigrants are lodged,

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and all boarding-houses for seamen, irrespective of the rate charged for lodging or boarding.

“The expression ‘keeper of a common lodging-house’ includes any person having or acting in the care and management of a common lodging-house.”

With respect to the legislation passed in connection with houses let in lodgings, the following are the principal enactments :—

England.—*Section 90* of the Public Health Act, 1875, states :

“The Local Government Board may, if they think fit, by notice published in the *London Gazette*, declare the following enactment to be in force within the district or any part of the district of any local authority, and from and after the publication of such notice, such authority shall be empowered to make byelaws for the following matters ; (that is to say)

1. For fixing, and from time to time varying, the number of persons who may occupy a house or part of a house which is let in lodgings or occupied by members of more than one family, and for the separation of the sexes in a house so let or occupied ;
2. For the registration of houses so let or occupied ;
3. For the inspection of such houses ;
4. For enforcing drainage and the provision of privy accommodation for such houses, and for promoting cleanliness and ventilation in such houses ;
5. For the cleansing and limewashing, at stated times, of the premises, and for the paving of the courts and court-yards thereof ;
6. For the giving of notices and the taking of precautions in case of any infectious disease.

“This section shall not apply to common lodging-houses within the provisions of this Act relating to common lodging-houses.”

In the **Housing of the Working Classes Act, 1885**, in *Section 8*, it is stated :—

“Whereas under *Section ninety* of the Public Health Act, 1875, the Local Government Board can declare that to be in force within the district of a sanitary authority, and after the publication of notice of such declaration, such authority is empowered to make byelaws with respect to lodging-houses, and it is expedient to authorise every such authority to make such byelaws without any declaration by the Local Government Board.

“Be it therefore enacted as follows :—

“Every sanitary authority shall have power to make byelaws for the matters specified in *Section ninety* of the Public Health Act, 1875.”

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Again, in the Housing of the Working Classes Act, 1890, in *Section 62* we find the following :—

“(1) The local authority may make byelaws for the management, use, and regulation of the lodging-houses, and it shall be obligatory on the local authority, except in the case of a lodging-house which is occupied as a separate dwelling, by such byelaws, to make provision for the several purposes expressed in the Sixth Schedule to this Act.

“(2) A printed copy or sufficient abstract of the byelaws relating to the management, use, and regulation of the lodging-houses shall be put up, and at all times kept in every room therein.”

The Sixth Schedule referred to in the foregoing is as under :—

“Byelaws to be made in all cases (except where a lodging-house is used as a separate dwelling)—

“For securing that the lodging-houses shall be under the management and control of the officers, servants, or others appointed or employed in that behalf by the local authority.

“For securing the due separation at night of men and boys above eight years old from women and girls.

“For preventing damage, disturbance, interruption, and indecent and offensive language and behaviour and nuisances.

“For determining the duties of the officers, servants, and others appointed by the local authority.”

The law as to houses let in lodgings in Scotland is found in the Public Health (Scotland) Act, 1897, *Section 72*, which is in all respects similar to that quoted under *Section 90* of the Public Health Act, 1875, applicable to England, while those sections quoted of the Housing of the Working Classes Acts also apply there.

Turning now to cellar dwellings, we find in *Section 71* of the Public Health Act, 1875, that it shall not be lawful to let or occupy separately as a dwelling any cellar (including any vault or underground room), built or rebuilt after the passing of this Act, or which is not lawfully so let or occupied at the passing of the Act.

Section 72 is important in that it embodies the conditions under which existing cellars may be let for occupation :—

“It shall not be lawful to let or occupy, or suffer to be occupied separately as a dwelling, any cellar whatsoever unless the following requisitions are complied with ; (that is to say)

“Unless the cellar is in every part thereof at least seven feet in height measured from the floor to the ceiling thereof, and is at least three feet of its height above the surface of the street or ground adjoining or nearest to the same, and

“Unless there is outside of and adjoining the cellar, and extending along the entire frontage thereof, and upwards from six

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inches below the level of the floor thereof up to the surface of the said street or ground, an open area of at least two feet and six inches wide in every part ; and

“ Unless the cellar is effectually drained by means of a drain, the uppermost part of which is one foot at least below the level of the floor thereof ; and

“ Unless there is appurtenant to the cellar the use of a water-closet, earth-closet, or privy, and an ashpit, furnished with proper doors and coverings, according to the provisions of this Act ; and

“ Unless the cellar has a fireplace with a proper chimney or flue, and an external window of at least nine superficial feet in area clear of the sash frame, and made to open in a manner approved by the surveyor (except in the case of an inner or back cellar let or occupied along with a front cellar as part of the same letting or occupation, in which case the external window may be of any dimensions not being less than four superficial feet in area clear of the sash frame).

“ Provided that in any area adjoining a cellar, there may be steps necessary for access to such cellar, if the same be so placed as not to be over, across, or opposite to the said external window, and so as to allow between every part of such steps and the external of such cellar, a clear space of six inches at least, and that over or across any such area there may be steps necessary for access to any building above the cellar to which such area adjoins, if the same be so placed as not to be over, across, or opposite to, any such external window.”

In *Section 74*, we have the definition of a cellar dwelling, viz. :—

“ Any cellar in which any person passes the night shall be deemed to be occupied as a dwelling within the meaning of this Act.”

Cellar dwellings may be closed for human habitation where two convictions against the provisions of the Act are recorded within three months. Vide *Section 75*.

Cellar dwellings are known as **Underground Dwellings** in the Public Health (Scotland) Act, 1897, where they are dealt with as follows :—

“ *Section 74*. It shall not be lawful to let separately, except as a warehouse or storehouse, or to suffer to be occupied as a dwelling-place, any cellar or any vault or underground room, whether conjoined or not with another apartment not having one of its external sides entirely above the level of the street or ground adjoining the same, and not having a window or other opening in such side, which cellar, vault, or room in every part shall be less in height from the floor to the ceiling than eight feet in the case of houses built prior to the commencement of this Act, or less in

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height than nine feet in the case of houses built subsequently to the commencement of this Act, or which shall be less than one-third of its height above the level of the street or ground adjoining the same, or otherwise shall not have three feet at least of its height from the floor to the ceiling above the said level, with an open area of two feet six inches wide from the level of the floor of such cellar, vault, or room, up to the level of the said street or ground, or which shall not have appurtenant thereto the use of a water-closet or earth-closet or privy and ashpit, or which shall not also have a glazed window made to open to the extent of half thereof, the full area of which is not less than nine superficial feet clear of the frame, and a fireplace with a chimney or flue, or which cellar, vault, or underground room, being an inner or back vault or cellar let or occupied along with a front vault or room as part of the same letting or occupation, has not a ventilating flue (unless such inner or back vault or cellar shall be part of a house built before the commencement of this Act), or which shall not be well and effectually drained by means of a drain, constructed of a gas-tight pipe, or otherwise effectually sealed, the uppermost part of which is one foot at least below the level of the floor of such vault, cellar, or room, after the local authority have given notice to the owner thereof that the letting or occupation of such cellars, vaults, or underground rooms as dwelling-places, is prohibited from that time forth, and it shall be the duty of the local authority to issue such notices from time to time, as soon as is convenient, until such notice has been given with respect to every cellar, vault, or underground room occupied as a dwelling-house within the district and it shall not be lawful, after such notice, to let or continue to let, or to occupy or suffer to be occupied separately as a dwelling-house any such vault, cellar, or underground room.”

Section 75 imposes a penalty on any one knowingly letting or suffering to be occupied as a dwelling any cellar, vault, or underground room contrary to the provisions of this Act.

Underground dwellings may be closed if two convictions are recorded against them within three months.

As to the Model Byelaws issued by the Local Government Board with respect to common lodging-houses, these are as follows :—

“ 4. A keeper of a common lodging-house shall not, except in such cases as hereinafter specified, cause or suffer any person of the male sex above the age of ten years to use or occupy any room which may be used or occupied as a sleeping apartment by persons of the female sex.

“ Such keeper shall not, except in such cases as are hereinafter specified, cause or suffer any person of the female sex to use or occupy any room which may be used or occupied as a sleeping

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apartment by persons of the male sex above the age of ten years.

“ Provided that this byelaw shall not be taken to prohibit the use and occupation by a husband and wife of any room which may be used or occupied by any other person of either sex above the age of ten years, or which may be used in accordance with the provisions of the byelaw in that behalf, as a sleeping apartment for married couples.

“ 5. Every keeper of a common lodging-house shall cause every room therein which may be appointed for use and occupation as a sleeping apartment by two or more married couples to be so furnished or fitted that every bed, when in use and occupation, shall be effectually screened from the view of any occupant of any other bed, by means of a partition of wood or other solid material, which shall be constructed and fixed or placed so as to allow adequate means of access to the bed which partition is intended to screen, and so as to extend upwards throughout the whole length and breadth of such bed to a sufficient height above such bed, and downwards to a distance of not more than six inches above the level of the floor.

“ 6. Every keeper of a common lodging-house shall cause every yard, area, forecourt, or other open space within the curtilage of the premises, to be maintained at all times in good order, and to be thoroughly cleansed from time to time, as often as may be reasonably necessary for the purpose of keeping such yard, area, forecourt, or other open space in a clean and wholesome condition.

“ 7. Every keeper of a common lodging-house shall cause the floor of every room or passage, and every stair in such house, to be thoroughly swept once at least in every day, before the hour of ten in the forenoon, and to be thoroughly washed once at least in every week.

“ 8. Every keeper of a common lodging-house shall cause every window, every fixture or fitting of wood, stone, or metal, and every painted surface in such house, to be thoroughly cleansed from time to time, as often as shall be requisite.

“ 9. Every keeper of a common lodging-house shall cause all bed-clothes and bedding, and every bedstead used in such house, to be thoroughly cleansed, from time to time, as often as shall be requisite for the purpose of keeping such bed-clothes, bedding, and bedstead in a clean and wholesome condition.

“ 10. Every keeper of a common lodging-house shall for the use of the lodgers received into such house, cause to be provided a sufficient number of basins or other receptacles for water, of adequate capacity and suitably placed, and a sufficient supply of water and a sufficient number of towels for use in connection with

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such basins or other receptacles. He shall cause such basins or receptacles to be kept clean and in good order, and the supply of towels to be renewed from time to time, as often as may be requisite.

“ 11. Every keeper of a common lodging-house shall cause all solid or liquid filth or refuse to be removed once at least in every day before the hour of ten in the forenoon from every room in such house, and shall once at least in every day cause every vessel, utensil, or other receptacle for such filth or refuse to be thoroughly cleansed.

“ 12. Every keeper of a common lodging-house shall cause the seat, floor, and walls of every water-closet, earth-closet, or privy belonging to such house to be thoroughly cleansed, from time to time, as often as may be necessary for the purpose of keeping such seat, floor, and walls in a clean and wholesome condition.

“ 13. Every keeper of a common lodging-house shall cause every part of the structure of every water-closet belonging to such house to be maintained at all times in good order, and every part of the apparatus of such water-closet, and every drain or means of drainage with which such water-closet may communicate, to be maintained at all times in good order and efficient action.

“ 14. Every keeper of a common lodging-house shall cause every earth-closet or privy belonging to such house, and every receptacle for filth provided or used in or in connection with such earth-closet or privy, to be maintained at all times in good order and in a wholesome condition.

“ He shall cause all such means or apparatus, as may be provided or used in connection with such earth-closet or privy, and such receptacles for the frequent and effectual application of dry earth or other deodorising substance to any filth deposited in such receptacle, to be maintained at all times in good order and efficient action.

“ He shall cause a sufficient supply of such dry earth or other deodorising substance to be, from time to time, provided for use in such earth-closet, privy, or receptacle for filth, and shall cause such dry earth or other deodorising substance to be frequently and effectually applied to such filth, or he shall cause dry earth or other deodorising substance as may, from time to time, be supplied to such house, in pursuance of the statutory provision in that behalf, by the Council or by any person with whom they may contract for the purpose, to be frequently and effectually applied to such filth.

“ 15. Every keeper of a common lodging-house shall cause every ashpit belonging to such house to be maintained at all times in good order and in a wholesome condition.

“ He shall not cause or suffer any filth or wet refuse to be

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thrown into any ashpit constructed and adapted for use only as a receptacle for ashes, dust, and dry refuse.

“ 16. Every keeper of a common lodging-house shall cause all such means of ventilation as may be provided in, or in connection with, any room or passage in such house, and in or in connection with any water-closet, earth-closet, or privy belonging to such house, to be maintained at all times in good order and efficient action.

“ 17. Every keeper of a common lodging-house shall, except in such cases as are hereinafter specified, cause every window in every room in such house which may be appointed for use and occupation as a sleeping apartment, to be opened and to be kept fully open for one hour at least in the forenoon, and for one hour at least in the afternoon of every day.

“ Provided that such keeper shall not be required, in pursuance of this byelaw, to cause any such window to be opened or to be kept open at any time when the state of the weather is such as to render it necessary that the window should be closed, or when any bed in such room may be occupied by any lodger in consequence of sickness or of other sufficient cause.

“ 18. Every keeper of a common lodging-house shall cause the bed-clothes of every bed in such house to be removed from such bed as soon as conveniently may be, after such bed shall have been vacated by any lodger, and shall cause all such bed-clothes and the bed from which such bed-clothes may have been removed to be freely exposed to the air for one hour at least in the forenoon, and one hour at least in the afternoon of each day.

“ 19. Every keeper of a common lodging-house, immediately after he shall have been informed or shall have ascertained that any lodger in such house is ill of an infectious disease, shall adopt all such precautions as may be necessary to prevent the spread of such infectious disease.

“ Such keeper shall not, at any time while such lodger is suffering from such infectious disease, cause or allow any other person, except the wife or any other relative of such lodger, or except a person voluntarily in attendance on such lodger, to use or occupy the same room as such lodger.

“ Where, in pursuance of the statutory provision in that behalf, the Council may order the removal of such lodger to a hospital or other place for the reception of the sick, such keeper, on being informed of such order, shall forthwith take all such steps as may be requisite on his part to secure the safe and prompt removal of such lodger in compliance with the order of the Council, and shall, in and about such removal, adopt all such precautions as, in accordance with any instructions which he may receive from

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the medical officer of health, may be most suitable for the circumstances of the case.

“ Where, in consequence of the illness of such lodger, there may be reasonable grounds for apprehending the spread of infection through the admission of lodgers to any room or rooms in such house, or through the admission to such room or rooms of the maximum number of lodgers authorised to be received therein ; such keeper, after being furnished with the necessary instructions from the medical officer of health, and until the grounds for apprehending the spread of infection shall have been removed, shall cease to receive any lodger in such room or rooms or shall receive therein such number of lodgers, being less than the maximum number, as the exigencies of the case may require.

“ Such keeper shall, immediately after the death, removal, or recovery of any lodger who may have been ill of any infectious disease, give written notice thereof to the medical officer of health, and shall, as soon as conveniently may be, cause every part of the room which may have been occupied by such lodger to be thoroughly cleansed and disinfected, and shall also cause every article in such room which may be liable to retain infection to be in like manner cleansed and disinfected unless the Council shall have ordered the same to be destroyed.

“ He shall comply with all instructions of the medical officer of health as to the proper cleansing and disinfection of the rooms and articles.

“ When the same shall have been thoroughly cleansed and disinfected in accordance with such instructions, he shall give written notice thereof to the medical officer of health ; and until two days from the giving of such notice shall have elapsed, and unless and until by such cleansing and disinfection the necessary precautions for preventing the spread of disease shall have been duly taken, such keeper shall not cause or suffer any other lodger to be received into the room which, in the case hereinbefore specified, may have been exposed to infection.

“ 20. A keeper of a common lodging-house shall not, at any time, cause or suffer any room which may be appointed for use as a kitchen or scullery, to be used or occupied as a sleeping apartment.

“ 21. A keeper of a common lodging-house shall not cause or suffer any bed in any room which may be used as a sleeping apartment by persons of the male sex above the age of ten years, to be occupied at any one time by more than one such person.

“ 22. A keeper of a common lodging-house shall not cause or suffer any lodger to occupy any bed in such house at any time within the period of eight hours after such bed shall have been vacated by the last preceding occupant thereof.

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“ 23. Every keeper of a common lodging-house shall cause every room in such house, which may be appointed for use and occupation as a sleeping apartment, to be furnished with a number of beds and bedsteads, and with such a supply of bed-clothes, and of necessary utensils as may be sufficient for the requirements of the number of lodgers received into such room.

“ 24. Every keeper of a common lodging-house, on receiving from the Council a notice or placard wherein shall be stated the description or number of the room to which such notice or placard shall apply, and the maximum number of lodgers authorised to be received at any one time in such room, shall put up and affix and continue such notice or placard in a suitable and conspicuous position in such room, and in such a manner that the words and figures in such notice or placard may be clearly and distinctly visible and legible.

“ He shall not, at any time, wilfully conceal, deface, alter, or obliterate any letter or figure in such notice or placard, or wilfully or carelessly injure or destroy such notice or placard.

“ 25. Every keeper of a common lodging-house, on receiving from the Council, for the purpose of exhibition in such house or in any room therein, a copy or copies of any byelaw or byelaws for the time being in force with respect to common lodging-houses, shall put up or affix and continue such copy or copies in a suitable and conspicuous position in such house, or in such room, and in such a manner that the contents of such copy or copies may be clearly and distinctly visible and legible.

“ He shall not, at any time, wilfully conceal, deface, alter, or obliterate any part of the contents of such copy or copies, or wilfully or carelessly injure or destroy such copy or copies.”

In the circular accompanying these byelaws, it is recommended that where provision is made for ventilation by windows, doors, and fireplaces, there should be at least 300 cubic feet of space per person.

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Chapter XV

SMOKE NUISANCE

THE emission of smoke is one which at all times more or less engages the attention of those interested in public health.

One only requires to look around in large manufacturing centres to see the effects of this means of polluting the atmosphere.

From a public health point of view, there is indeed a grave danger from this emission of smoke from chimneys, in that the quantity of carbonic acid gas thus liberated, together with the accompanying grit, smuts, carbon, etc., are a serious menace to the health and well-being of those who, day in and day out, have to inhale this vitiated atmosphere.

In an earlier chapter we saw the importance of pure air, or, at any rate, comparatively pure air, being breathed, and also the effects, in a small degree, which come from inhaling bad or tainted air.

It is true that a certain amount of smoke must, under existing industrial conditions, pass daily and even nightly into the atmosphere, but what we as sanitarians are troubled with is the excessive smoke which belches forth from chimney heads, and which in many cases could be abated or remedied.

There are two methods of air pollution by smoke.

The first is from chimneys of dwelling-houses, and the second from chimney-stacks in industrial centres.

With regard to the first of these, one finds that to-day, when modern housing schemes are in the forefront of a health programme, this question is being handled in a manner likely to give good results. Indeed, in one of the most advanced housing schemes carried out recently by a Scottish corporation under the authority of the Ministry of Health Housing Scheme, central heating has been introduced, whereby the houses (250 in number) are heated by steam and supplied with hot water from a central heating station ; the houses have therefore only one chimney each.

In this way the number of chimneys have been reduced to at least a quarter of what they would have been under the old order of things, and while central heating cannot be applied in every direction, other means are open to us to curtail the number of coal fires, and so reduce the quantity of smoke passing into the air.

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Now, ordinary coal fires may be substituted by slow-combustion stoves, in which anthracite coal, which gives off very little smoke, is burned ; or, as a second consideration, gas fires and stoves, together with gas radiators, may be installed.

Old customs die hard, however, and the sentimental leanings of the Britisher towards the old wasteful, hot and cold by turns, coal fire are so strong that it will take a little time to wear down the prejudice against modern ideas of assisting to obtain less air pollution from this source.

But the second method of air pollution is by far the worst, namely, the smoke from chimney-stacks of works and factories.

Here it must be admitted there is ample room for improvement. In many cases, much is certainly done to give little or no offence by the owners of these chimneys, but, on the other hand, much more could be done by the majority of factory owners to assist in improving and remedying this type of nuisance.

Black smoke from chimney-stacks may be due to a variety of causes, among which are the following :—

Cheap and dirty coal used for firing the boilers.

Faulty boiler construction.

Bad firing, or firing at irregular intervals.

Want of sufficient boiler power, besides other minor troubles.

Taking these causes of black smoke and analysing them in the order given, we get the following :—

Cheap and dirty coal is often used on what is erroneously supposed to be economical grounds. A firm of manufacturers faced with a large daily consumption of coal decides on the basis of expense to place contracts for a cheaper, if inferior, quality of coal. The consequence is that the fireman has to feed his furnaces with a coal which contains a large quantity of dirt and dust, and this is no sooner applied to the fire than it is converted into dense volumes of heavy black smoke.

Again, where inferior coal is used, the heat generated is less, and the result is that heavy banking of fires takes place, while, in addition, firing has to take place much oftener in order to keep the necessary pressure of steam up in the boiler.

Where good coal is used, one gets a cleaner fire, greater heat, less smoke, and a longer interval between the periods of firing.

Under the head of faulty boiler construction, one frequently finds that the brick bridges have not been properly built, or that by some mechanical defect it is almost impossible for the furnace to consume any of the smoke generated therein. This can only be remedied by having such defects removed or repaired.

Bad firing, which may be said to include firing at irregular intervals, is the cause of much trouble in connection with smoke

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nuisance, particularly in small establishments. In many cases the fireman seems to imagine that his duty consists of replenishing the fire, when he thinks fit, by simply shovelling the coals into the furnace with more energy than knowledge. Fortunately, many of our large industries employ firemen who have attended classes specially organised for their training, and at the conclusion of the classes an examination is held and certificates granted to those who have passed the test in the technical and practical part of their work. Firing may be done in different ways. Some firemen prefer uniform firing—that is, the coal is spread lightly over the fires. This method is all right, provided that firing is fairly frequent and the coal only lightly applied. Others prefer side firing, which implies that the coal is applied along one side of the furnace only during the operation, the sides of the fire being fed alternately. By this system, one-half of the fire is left bright and red, and the heat from this half helps to consume the smoke coming from the freshly coaled half. These two methods are the principal manual systems employed, but there are quite a number of mechanical firing devices on the market and installed in many works. Some of these devices lift the coal and convey it either over the furnace or alongside same, thus feeding the fire uniformly or side fire, while in another type, the fresh coal is carried along under part of the fire, and feeds the furnace from below. A great deal could be written in connection with these “ mechanical stokers,” and it must be conceded that where properly fitted, they do mitigate the smoke nuisance and do away with the trouble often caused by careless firemen.

In most furnace doors a revolving ventilator is fitted, and this should be left open after firing. It is a good plan, however, to insist on the fireman leaving the furnace door open a little for a short time after the operation of stoking, as in this way the current of air passing into the furnace will help to diffuse the smoke arising from the freshly applied coal. A study of a chimney-head after firing, and noting the difference with the door of the furnace closed and open, will surprise those who might be inclined to criticise such a simple expedient. The fireman, however, does not care for this idea, as the incoming cold air is apt to reduce his steam pressure. Other ideas in use are forced draught ; here, the fireman, after stoking, opens valves or openings under the furnace, and the air rushes in and assists in forcing the fire and diffusing the smoke.

In some furnaces, steam pipes are fitted, and the fireman has simply to open the valves occasionally, when the jets of steam thus liberated pass into the back part of the furnace and break up and diffuse the black smoke.

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We now come to the want of sufficient boiler power. It very often happens that an industry, as time goes on, develops considerably, and as a consequence, more plant and machinery, together with additional engines are set up, but the boiler power of the original establishment remains the same. The consequence of this state of affairs is that in order to keep up the necessary pressure of steam the fireman has to be continually "chasing" his fires; stoking must be done oftener, and he cannot afford to leave the door of the furnace open for even a short time. The result is that every few minutes a volume of black smoke is liberated into the atmosphere. Where this state of affairs exists, there is only one remedy which is obvious.

We will now deal with the part played by the inspector in dealing with the matter of the causes of black smoke.

It is, of course, necessary that the inspector should be accompanied by an assistant, and that they should be provided with smoke observation notebooks and stop watches. These watches must be synchronised, as it is very important that both watches should record the same minute exactly during the time the chimney is under observation. A suitably situated position, or rather two positions, must be selected, and these should not be so situated that the one inspector can see or communicate with the other during the time of observation, while the positions should be such as to give a clear and uninterrupted view of the chimney-head which is to be watched.

It will have been decided that the observation is to last for a given period, usually an hour, and the exact hour is now fixed.

Many methods can be employed for registering the smoke issuing from the chimney-head, but the best method is by means of the ordinary vision, and noting the results in a smoke nuisance report book.

On the first page, the inspector will be careful to note the date, the name of the firm to which the chimney belongs, situation of works and of chimney, the type, nature of construction, and approximate height of chimney, the period during which observation is to be conducted, the point from which the observation is taken, the direction of the wind, strength of wind, and atmospheric conditions. A copy of the pages of an ordinary smoke report book is herewith appended, with notes showing the observation of the smoke issuing from the chimney-head minute by minute.

Needless to say, it takes a little practice before two persons can take notes which are what one might say correspondingly equal. Slight differences in vision, and the exact minute when black smoke changes from black to brown or grey, are apt to bring out little differences, but with a little practice and understanding

SMOKE NUISANCE.

REPORT BOOK.

Date.		SITUATION OF CHIMNEY.	Black.	Light.	Nil.	Black.	Light.	Nil.	TOTAL.
1920. June	6th	Messrs. Black and Brown, Cotton Spinners, Reid Street, Letham. Round brick chimney, bell mouth. Height app. 120 feet. From 10 ^{<u>30</u>} _{A.M.} to 11 ^{<u>30</u>} _{A.M.} Observation from 43 Gray Street. Top-flat window of tenement. S.W. wind. Slight breeze. Clear day. Some sunshine.	..	10 ^{<u>30</u>} _{A.M.} -31	..	..	1	..	1
			31-34	34-39	39-44	3	5	5	13
			..	44-45	..	..	1	..	1
			45-49	49-57	57-11 ^{<u>3</u>} _{A.M.}	4	8	6	18
			..	3-5	2	..	2
			5-7	7-12	..	2	5	..	7
			12-15	15-18	18-20	3	3	2	8
			..	20-22	2	..	2
			22-27	27-30	..	5	3	..	8
						17	30	13	60



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each other's method of working, these difficulties are overcome ; and here let it be pointed out that one of the temptations that assail the inexperienced smoke inspector, is to call brown or dark smoke black. No doubt the one is just as injurious to health as the other, and in every way as great a nuisance, but the practice only leads to confusion all round.

Having completed the observation, the record will be entered into the smoke register book kept in the office, and if considered necessary, a letter giving the details of black, light, or grey, and no smoke, will be sent to the offending firm, and this letter will be used as a warning in any proceedings which may at a future time be instituted against the firm.

If the observation has been for the purpose of a prosecution, the inspectors, immediately the observation is over, will meet and compare notes, and if these correspond to within, say, a minute of each other, they will then call at the works and interview the person in charge. They will also proceed to the boiler-house and interview the fireman in charge of the furnaces, who, as a rule, is charged along with the principals, and an opportunity given for any excuse to be offered. The inspectors will, if requested, show their notes, and will then note the following particulars among others : Name and address of fireman ; number of boilers and furnaces ; type of boilers ; working pressure on each boiler ; horsepower of engines driven by steam from boilers ; if any system of mechanical stokers is fitted ; if there is induced or forced draught in furnaces ; square area of fire grate ; system of stoking ; if there are ventilators in furnace doors ; if doors are left open after stoking ; the class of coal burned ; the quantity of coal consumed per day ; if fireman has had any special course or training in his duties, and if he has any other duty assigned him other than those of fireman.

The particulars having been taken, the inspectors return to the office and prepare their information for entering the case in court.

This brings us to the legal aspect of the case for smoke nuisance.

We will take first *Section 91, sub-section 7* of the **Public Health Act, 1875**, where it states :—

“ Any fireplace or furnace which does not as far as practicable consume the smoke arising from the combustible used therein, and which is used for working engines by steam, or in any mill, factory, dyehouse, brewery, bakehouse, or gaswork, or in any manufacturing or trade process whatsoever ; and any chimney (not being the chimney of a private dwelling-house) sending forth black smoke in such quantity as to be a nuisance, shall be deemed to be nuisances liable to be dealt with summarily in manner provided by this Act.

“ Provided that where a person is summoned before any court

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in respect of a nuisance arising from a fireplace or furnace which does not consume the smoke arising from the combustible used in such fireplace or furnace, the court shall hold that no nuisance is created within the meaning of this Act, and dismiss the complaint, if it is satisfied that such fireplace or furnace is constructed in such a manner as to consume, as far as practicable, having regard to the nature of the manufacture or trade, all smoke arising therefrom, and that such fireplace or furnace has been carefully attended to by the person having the charge thereof."

As the powers for dealing with smoke nuisance are in a way rather limited in the principal Act, many Local Authorities, including Bolton, Manchester, Leeds, Salford, Sheffield, Edinburgh, and Glasgow, have promoted and had passed private Bills and Orders.

In the **Public Health (Scotland) Act, 1897**, *Section 16, subsections 9 and 10*, we have the following:—

"(9) Any fireplace or furnace situated within the limits of any burgh or special scavenging district, which does not so far as practicable consume the smoke arising from the combustible matter used therein, for working engines by steam, or in any mill, factory, dyehouse, brewery, bakehouse, or gaswork, or in any manufacturing or trade process whatsoever ;

"(10) Any chimney (not being the chimney of a private dwelling-house) sending forth smoke in such quantity as to be a nuisance or injurious or dangerous to health, shall be deemed to be nuisances liable to be dealt with summarily in manner provided by this Act."

In addition to the above, powers are given for dealing with smoke nuisances in the **Smoke Nuisance (Scotland) Abatement Act of 1857**, which is stated to be "an Act for the Abatement of Nuisance arising from the Smoke of Furnaces in Scotland"; and the following are its main provisions:—

"*Section 1.*—From and after the first day of August One thousand eight hundred and fifty-eight, every furnace employed or to be employed in the working of engines by steam, whether locomotive or otherwise, in any place to which this Act shall apply, or on board of any steam-vessel stopping at or in any such place, or in any port, pier, landing-place, or harbour, within the same, or when plying on any part of a river which at such part shall not exceed a quarter of a mile in breadth, and every furnace employed, or to be employed in any mill, factory, distillery, brewhouse, sugar refinery, bakehouse, gasworks, waterworks (although a steam-engine be not employed therein), or in any public bath or washhouse within the same, although such public bath or washhouse shall not be used for the purposes

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of trade or manufacture, shall in all cases be constructed or altered so as to consume or burn the smoke arising from such furnace ; and if any person or company shall, after the first day of August One thousand eight hundred and fifty-eight, use in any such place, or on board any such steam-vessel, any such furnace which shall not be constructed so as to consume or burn its own smoke, or shall so negligently use any such furnace as that the smoke arising therefrom shall not be effectually consumed or burnt, every person or company so offending, being the owner or occupier of the premises, or the owner of the locomotive engine in which any such furnace shall be, or being a foreman or other person employed by such owner or occupier in connection with such furnace, or being the owner or master or other person in charge for the time being of any such steam-vessel, shall, upon a summary conviction for such offence before the Sheriff or Sheriff-Substitute of the county, or any two Justices having jurisdiction within the place within which, or adjacent to the port, pier, landing-place, river, or harbour in which the offence against this Act is alleged to have been committed, where such place is not a burgh, and where such place is a burgh, then before the Sheriff or Sheriff-Substitute of the county within which or within any part of which the same shall be situate, or before the Magistrate of such burgh, forfeit and pay a sum not more than Five pounds nor less than Forty shillings, and upon a second conviction for such offence, the sum of Ten pounds, and for each subsequent conviction a sum double the amount of the penalty imposed for the last preceding conviction, and shall also pay to the Local Authority the whole costs incurred in the proceedings for the recovery of any such penalty.

“ *Section 2.*—Provided always, that the words ‘consume or burn the smoke,’ shall not be held in all cases to mean ‘consume or burn all the smoke’ ; and that the Sheriff, Sheriff-Substitute, Magistrates, or Justices before whom any person shall be summoned may remit the penalties enacted by this Act, if he or they shall be of opinion that such person has so constructed or altered his furnace as to consume or burn, as far as possible, all the smoke arising from such furnace ; and it shall be lawful for such Sheriff, Sheriff-Substitute, Magistrates, or Justices, with the consent of such person, on the hearing of the petition hereinafter mentioned, to appoint a competent person to examine such furnace, and to report thereupon whether it has been so constructed or altered.

“ *Section 3.*—Provided always, that no complaint shall be brought against any person for the recovery of any penalty under this Act, except by the Local Authority, or by the owner or occupier of premises with reference to which the furnace is so

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situate as to create an annoyance to the occupiers of such premises, and in either case with the concurrence of the Lord Advocate.

“ *Section 4.*—All complaints which shall be brought, and all applications to the Sheriff, Sheriff-Substitute, Magistrates, or Justices to enforce any provision of this Act, shall be by summary petition, and such petition shall refer to the clauses of the Act on which it is founded, without setting forth the same ; and the Sheriff, Sheriff-Substitute, Magistrates, or Justices shall thereupon appoint the petition to be answered within three days, or may order the parties to attend him or them in person forthwith, and on advising such answer, or hearing the parties, may at once decern, or may if either party desire it, order proof to be led on specific points, and shall in that case appoint a day, not more than five days thereafter, for hearing such proof, and if the proof be not on that day completed, may adjourn the same from time to time until completed, and within three days after such completion shall give decree, and may find the party complained of liable in expenses, and may grant warrant for the recovery of the penalties and expenses decerned for, and failing payment within eight days after conviction, by poinding and imprisonment for a period at the discretion of the Sheriff, Sheriff-Substitute, Magistrates, or Justices, not exceeding fourteen days.”

By *Section 5*, no written pleadings are allowed other than the petition and answers (when ordered), while by *Section 6* Justices or Magistrates, dealing with a petition, who are satisfied that the cost of altering or amending any furnace would exceed twenty-five pounds, such Magistrates or Justices need not act, and they may grant a certificate to that effect, and it shall thereupon be incompetent for the Local Authority to proceed further, although proceedings may be taken anew before the Sheriff or Sheriff-Substitute.

Section 7 deals with modes of appeal, and *Sections 8* and *9* deal with expenses and how these may be awarded ; while *Section 10* deals with the service of notices and petitions. These may be served by delivering them at the residence of parties to whom addressed, and in the case of companies, at their nearest office, station, or place of business, or by being put into the post office duly addressed, or they may be served by delivering a true copy to some person on the premises, or one of the crew of a steam-vessel.

Sections 11, 12, and 13 deal with the expenses of prosecutions and the methods of applying moneys recovered by convictions. These, however, call for no comment here, but the following should be noted :—

“ *Section 14.*—In this Act the word ‘place’ shall mean every city or royal burgh in Scotland, and shall include the whole

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area contained within the parliamentary or police limits or boundaries thereof, provided the same comprehend a population of not less than two thousand, and shall also mean and include every burgh of barony, burgh of regality, containing a similar amount of population, according to the census for the time being presented to both Houses of Parliament by command of her Majesty ; and the expression ‘ Local Authority ’ shall mean the Procurator-Fiscal of the burgh or county, or of any district thereof, or the Commissioners of Police acting under any local or general Act of Parliament within any such place or any part thereof.”

The Smoke Nuisance (Scotland) Act Amendment Act, 1861, amends the powers in connection with expenses of applications, while the **Smoke Nuisance (Scotland) Acts Amendment Act, 1865**, in *Section 1* amends *Section 14*, just quoted, of the Act of 1857 by stating that the word “ place ” shall mean and include every burgh and town in Scotland which is not a royal burgh, and which has a population of not less than two thousand inhabitants ; the provisions of the main Act to apply to such burghs and towns.

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Chapter XVI

NUISANCES

As will have been noted, the sanitary inspector is termed, in some of the Acts relating to his work, the inspector of nuisances, and this definition may be said to be quite appropriate as attending to nuisances which form a very large part of his work.

Blackstone has defined a nuisance at common law as "anything which worketh hurt, inconvenience, or damage to anyone," while the same authority defines a private nuisance as "anything done to the hurt or annoyance of the lands, tenements, or hereditaments of another," and again his definition of a public nuisance is "those which affect the public and are an annoyance to all the King's subjects."

In sanitary law the term "nuisance" is very often limited to those nuisances which are injurious to health. Professor A. Wynter Blyth, however, embraces statutory nuisances in the following definition: "A nuisance is something which actually injures or is likely to injure health, and admits of a remedy either by the individual who causes it, or by the Local Authority."

Justices are advised by Glen not to act "unless it be proved that the particular thing complained of is a nuisance injurious to health, or that it is likely in a substantial degree to injure the health of persons passing by or living near the premises on which it exists."

These authorities are here quoted in order to give the student an idea of what is required in dealing with complaints under this head, and to point out that ability to show that a nuisance is injurious or dangerous to health will greatly strengthen a case and make for a successful issue to any proceedings taken.

Statutory nuisances are the only ones with which the student of sanitary law will have to deal.

The sections dealing with nuisances are found in various parts of the Acts, but we will consider them here in tabulated form, taking the principal nuisance sections of the Public Health Act, 1875, first.

N.B.—It must here be pointed out that the whole of Section 91, with its seven sub-sections, must be committed to memory by the student in English sanitary law, while the student in Scotch law must do the same in connection with the sub-

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sections of Section 16 of the Public Health (Scotland) Act, 1897, which we will deal with later.

The principal nuisance sections of the **Public Health Act, 1875**, are found in *Sections 91-110*. We will take *Section 91* in full, thus :—

“ 91. For the purposes of this Act—

- (1) Any premises in such a state as to be a nuisance or injurious to health ;
- (2) Any pool, ditch, gutter, watercourse, privy, urinal, cess-pool, drain, or ashpit so foul or in such a state as to be a nuisance or injurious to health ;
- (3) Any animal so kept as to be a nuisance or injurious to health ;
- (4) Any accumulation or deposit which is a nuisance or injurious to health ;
- (5) Any house or part of a house so overcrowded as to be dangerous or injurious to the health of the inmates, whether or not members of the same family ;
- (6) Any factory, workshop, or workplace (not already under the operation of any general Act for the regulation of factories or bakehouses), not kept in a cleanly state, or not ventilated in such a manner as to render harmless as far as practicable any gases, vapours, dust, or other impurities generated in the course of the work carried on therein that are a nuisance or injurious to health, or so overcrowded while work is carried on as to be dangerous or injurious to the health of those employed therein ;
- (7) Any fireplace or furnace which does not so far as practicable consume the smoke arising from the combustible used therein, and which is used for working engines by steam, or in any mill, factory, dyehouse, brewery, bakehouse, or gaswork, or in any manufacturing or trade process whatsoever ; and
- (8) Any chimney (not being the chimney of a private dwelling-house) sending forth black smoke in such quantity as to be a nuisance,

shall be deemed to be nuisances liable to be dealt with summarily in manner provided by this Act, provided—

“ *First.* That a penalty shall not be imposed on any person in respect of any accumulation or deposit necessary for the effectual carrying on of any business or manufacture, if it be proved to the satisfaction of the court that the accumulation or deposit has not been kept longer than is necessary for the purpose of the business

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or manufacture, and that the best available means have been taken for preventing injury thereby to the public health.

“*Secondly.* That where a person is summoned before any court in respect of a nuisance arising from a fireplace or furnace which does not consume the smoke arising from the combustible used in such fireplace or furnace, the court shall hold that no nuisance is created within the meaning of this Act, and dismiss the complaint, if it is satisfied that such fireplace or furnace is constructed in such manner as to consume as far as practicable, having regard to the manufacture or trade, all smoke arising therefrom, and that such fireplace or furnace has been carefully attended to by the person having the charge thereof.”

By *Section* 92 of this Act, it is the duty of every Local Authority to cause inspection to be made of their district from time to time for the purpose of ascertaining if nuisances exist calling for abatement under the provisions of the Act, and to enforce such provisions.

Any person who is aggrieved by any nuisance may give information of the same, under *Section* 93, to the Local Authority of the district.

The Local Authority, under powers conferred in *Section* 94, can serve a notice requiring the abatement of any nuisance.

Should the terms of such notice not be complied with in the time specified, the Local Authority, by virtue of *Section* 95, may make complaint to a Justice.

Section 96 gives power to a court of summary jurisdiction to make an order to abate a nuisance, and where deemed necessary impose a penalty.

In any case where a nuisance is proved to render a house or building unfit for human habitation, the court may, by *Section* 97, grant an order prohibiting such house to be occupied until such nuisance has been removed, and on the court being satisfied that such nuisance has been abated, they may withdraw the prohibition and again allow the house to be let for human habitation.

Should any person not obey an order of the court for abating a nuisance, the court may inflict a penalty under *Section* 98.

Appeals may be made against an order granted by a court of summary jurisdiction. Such appeals to be to the quarter sessions, as stated in *Section* 99.

By *Section* 100 an order of court may be addressed to and executed by the Local Authority, where the author of the nuisance or the owner or occupier of any premises is not known or cannot be found.

Section 101.—Where, in dealing with a nuisance, the Local Authority have had to remove any matter or thing, the Local

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Authority may sell or otherwise dispose of it, and after paying the expenses incurred from the proceeds, they shall pay the surplus (if any) to the owner of the matter or thing, on demand.

Power of entry is given in *Section 102* during all reasonable hours, to any place, building, etc., until the nuisance is abated.

Should admission be refused to any place where an order of the court is operative, a penalty may be inflicted as laid down in *Section 103*.

Section 104 deals with the question of costs and expenses incurred with the working of nuisance provisions ; these, however, we need not trouble with further here.

The powers of an individual to complain to a Justice with respect to a nuisance are, by reason of the provisions of *Section 105*, the same as those of a Local Authority.

If the Local Authority have made default in doing their duty with regard to nuisances, in the opinion of the Local Government Board, such Board may authorise any officer of police in the district to discharge the duties enumerated in this Act to be carried out by a Local Authority, *vide Section 106*.

By *Section 107* a Local Authority may take proceedings with regard to nuisances in a superior court, if they consider that any penalty likely to be imposed by a lesser court would be inadequate.

Local Authorities may, by virtue of the terms of *Section 108*, take the like proceedings with regard to any nuisance outwith their district as if the nuisance were in their own district, provided, of course, that the nuisance affects any part of their own district.

Section 109 gives a court of summary jurisdiction powers to close a house if two convictions for overcrowding have been recorded against it within three months.

Section 110 confers the same powers on Local Authorities with regard to nuisances on land, to any ship or vessel lying in any river, harbour, or other water within the district of a Local Authority.

These sections contained the nuisances dealt with in that part of the Act under the heading of that name, but scattered throughout the Act, and in other Acts, we have other nuisances, with which we will now deal.

Going back to *Section 18* of this Act, we find that where sewers are altered or discontinued or destroyed, such work must be done so as not to create a nuisance, while in the following *Section 19*, Local Authorities must cause sewers belonging to them to be so constructed, covered, ventilated, and kept so as not to be a nuisance or injurious to health.

Passing on to *Section 41*, we find that on the written application of any person to the Local Authority, that any drain, water-

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closet, earth-closet, privy, ashpit, or cesspool within the district is a nuisance or injurious to health (but not otherwise), the Local Authority may by writing empower their surveyor or inspector of nuisances, after twenty-four hours' written notice has been given to the occupier of such premises, to enter such premises with or without assistants, and if a nuisance is found to exist, the Local Authority shall serve a notice in writing calling upon the owner or occupier to abate such nuisance within a reasonable time, and failing the terms of the notice being complied with, the Local Authority may themselves do the work and recover the expenses in a summary manner.

Section 47 deals with other types of nuisances—i.e. “Any person who in any urban district—

- (1) Keeps any swine or pigsty in any dwelling-house, or so as to be a nuisance to any person ; or
- (2) Suffers any waste or stagnant water to remain in any cellar or place within any dwelling-house for twenty-four hours after written notice to him from the urban authority to remove the same ; or
- (3) Allows the contents of any water-closet, privy, or cesspool to overflow or soak therefrom,

shall for every such offence be liable to a penalty not exceeding forty shillings, and to a further penalty not exceeding five shillings for every day during which offence is continued, and the Urban Authority shall abate or cause to be abated every such nuisance, and may recover in a summary manner the expenses incurred by them in so doing, from the occupier of the premises on which the nuisance exists.”

With regard to proceedings in certain cases against nuisances, *Section 255* gives the following particulars :—

“Where any nuisance under this Act appears to be wholly or partially caused by the acts or defaults of two or more persons, it shall be lawful for the Local Authority or other complainant to institute proceedings against any one of such persons, or to include all or any two or more of such persons in one proceeding ; and any one or more of such persons may be ordered to abate such nuisance, so far as the same appears to the court having cognizance of the case to be caused by his or their acts or defaults, or may be prohibited from continuing any acts or defaults which, in the opinion of such court, contribute to such nuisance, or may be fined or otherwise punished ; notwithstanding that the acts or defaults of any one of such persons would not separately have caused a nuisance ; and the costs may be distributed as to such court may appear fair and reasonable.

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“ Proceedings against several persons included in one complaint shall not abate by reason of the death of any among the persons so included, but all such proceedings may be carried on as if the deceased person had not been originally so included.

“ Whenever in any proceeding under the provisions of this Act relating to nuisances, whether written or otherwise, it becomes necessary to mention or refer to the owner or occupier of any premises, it shall be sufficient to designate him as the ‘ owner ’ or ‘ occupier ’ of such premises, without name or further description.

“ Nothing in this section shall prevent persons proceeded against from recovering contribution in any case in which they would now be entitled to contribution by law.”

Although this completes the nuisances dealt with in the principal Act, there are still one or two others which we must take.

The first is *Section 9* of the **Housing of the Working Classes Act, 1885**. This section deals with tents and vans used for human habitation, and it is provided—

“ A tent, van, shed, or similar structure used for human habitation, which is in such a state as to be a nuisance or injurious to health, or which is so overcrowded as to be injurious to the health of the inmates, whether or not members of the same family, shall be deemed to be a nuisance within the meaning of *Section 91* of the Public Health Act, 1875, and the provisions of that Act shall apply accordingly.”

Next we take *Section 17* of the **Public Health Acts Amendment Act, 1890**, which makes the following provision :—

“ (1) Every person who turns or permits to enter into any sewer of a Local Authority or any drain communicating therewith—

- (a) Any chemical refuse, or
- (b) Any waste steam, condensing water, heated water, or other liquid (such water or other liquid being of a higher temperature than one hundred and ten degrees of Fahrenheit),

which either alone or in combination with the sewage, causes a nuisance or is dangerous or injurious to health, shall be liable to a penalty not exceeding ten pounds, and to a daily penalty not exceeding five pounds.”

As this completes the list of nuisances in the main Acts which apply to England, we will now discuss the nuisances as laid down under the law in Scotland.

Thus, in *Section 3* of the **Public Health (Scotland) Act, 1897**, we have the following definition :—

“ The expression ‘ author of a nuisance ’ means the person

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through whose act or default the nuisance is caused, exists, or is continued, whether he be the owner or occupier or both."

The nuisances proper are dealt with in this Act in *Section 16*. These we will take in full, as the student in sanitary law for the examination of Scotland will require to commit them to memory:—

- " (1) Any premises or part thereof, of such a construction or in such a state as to be a nuisance or injurious or dangerous to health ;
- (2) Any street, pool, ditch, gutter, watercourse, sink, cistern, water-closet, earth-closet, privy, urinal, cesspool, drain, dungpit, or ashpit, so foul or in such a state or so situated as to be a nuisance or injurious or dangerous to health ;
- (3) Any well or water supply injurious or dangerous to health ;
- (4) Any stable, byre, or other building in which any animal or animals are kept in such a manner or in such numbers as to be a nuisance or injurious or dangerous to health ;
- (5) Any accumulation or deposit, including any deposit of mineral refuse, which is a nuisance or injurious or dangerous to health, or any deposit of offensive matter, refuse or offal, or manure (other than farmyard manure or manure from byres or stables or spent hops from breweries), within fifty yards of any public road, wherever situated, or any offensive matter, refuse or offal, or manure, other than aforesaid, contained in uncovered trucks or waggons standing or being at any station or siding or elsewhere on a railway or in canal boats, so as to be a nuisance or injurious or dangerous to health ;
- (6) Any work, manufactory, trade, or business, injurious to the health of the neighbourhood, or so conducted as to be injurious or dangerous to health, or any collection of rags or bones injurious or dangerous to health ;
- (7) Any house or part of a house so overcrowded as to be injurious or dangerous to the health of the inmates ;
- (8) Any schoolhouse, or any factory which is not a factory subject to the provisions of the Factory and Workshops Acts, 1878 to 1895, or any Act amending the same with respect to cleanliness, ventilation, or overcrowding, that
- (i) is not kept in a cleanly state and free from effluvia arising from any drain, privy, water-closet, earth-closet, urinal, or other nuisance, or

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- (ii) is not ventilated in such a manner as to render harmless so far as practicable any gases, vapours, dust, or other impurities generated in the course of the work carried on therein that are a nuisance or injurious or dangerous to health, or
- (iii) is so overcrowded while work is carried on as to be injurious or dangerous to the health of those therein employed ;
- (9) Any fireplace or furnace situated within the limits of any burgh or special scavenging district which does not so far as practicable consume the smoke arising from the combustible matter used therein for working engines by steam, or in any mill, factory, dyehouse, brewery, bakehouse, or gaswork, or in any manufacturing or trade process whatsoever ;
- (10) Any chimney (not being the chimney of a private dwelling-house) sending forth smoke in such quantity as to be a nuisance or injurious or dangerous to health ; and
- (11) Any churchyard, cemetery, or place of sepulture so situated or so crowded or otherwise so conducted as to be offensive or injurious or dangerous to health ;

shall be deemed to be nuisances liable to be dealt with summarily in manner provided by this Act.

“ Provided that—

- (a) A penalty shall not be imposed as hereinafter provided on any person in respect of any accumulation or deposit necessary for the effectual carrying on of any business, trade, or manufacture, if it be proved to the satisfaction of the court that the accumulation or deposit has not been kept longer than is necessary for the purposes of the business, trade, or manufacture, and that the best available means have been taken for preventing injury or danger thereby to the public health ; and
- (b) In considering whether any dwelling-house, or part thereof, which is also used as a factory, or whether any factory, used also as a dwelling-house, is a nuisance by reason of overcrowding, the court shall have regard to the circumstances of such other use.”

Section 17 of this Act corresponds with *Section 92* of the English Act, making it the duty of the Local Authority to inspect their district from time to time for the detection and abatement of nuisances, and power of entry is given medical officers and

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sanitary inspectors under *Section 18* to enter any premises at all reasonable times where they have reason to believe nuisances exist, while other provisions of this section are similar to those of *Section 41* of the English Act of 1875.

Section 19 resembles *Section 105* of the 1875 Act, in that it gives power for any individual to make complaint of a nuisance to the Local Authority, and the latter shall give their officials instructions to give intimation of such nuisance to the author of the nuisance or owner of the premises.

By *Section 20* we have the authority for serving written notice on the author of a nuisance which may be dealt with summarily, requiring such author to abate the nuisance within a time specified in the notice, and further to prevent a recurrence of the nuisance once abated. In this section, it is provided that if the nuisance is from want or defect of a structural character, or if the premises are unoccupied, the notice shall be served on the owner; and again, where the author of the nuisance cannot be found, and the owner or occupier of the premises is not at fault, the Local Authority may abate the nuisance themselves.

Under *Section 21*, where notice is not complied with, the Local Authority are empowered to proceed summarily with the case.

Complaint may be made by the Local Authority, under *Section 36*, to the Sheriff by summary petition regarding any nuisance created by an offensive trade, and on conviction the owner or occupier of the premises may be penalised.

A nuisance may be created by a Local Authority in dealing with house and street refuse, especially at the place selected for a depot or dump, and under *Section 37*, proceedings may be instituted against the Local Authority to have such nuisance removed and abated.

Nuisances in connection with tents, vans, and sheds are dealt with in *Section 73* of this Act, and these are the same as already referred to in dealing with *Section 9* of the Housing of the Working Classes Act, 1885.

Sewers, under *Section 103*, must be constructed, maintained, kept, and cleansed so as not to be a nuisance.

No drain or sewer must be connected to any other sewer or drain if the admixture of the sewage of the two drains or sewers shall cause damage to the sewers or create a nuisance. (*Vide Section 110.*)

Section 146 deals with the legal procedure with respect to nuisances should the Local Authority neglect its duty under the Act, while by *Section 148* the Local Government Board may cause proceedings to be taken by the procurator-fiscal of the

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sheriff court of the district where the nuisance exists, while with respect to a nuisance which is offensive or injurious or dangerous to any other district adjoining, and the Local Authority of the district in which the nuisance exists does not cause such nuisance to be abated or removed, the Local Government Board may, under *Section 149*, call upon the Local Authority of that district to remove or abate the nuisance.

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Chapter XVII

DUTIES OF A SANITARY INSPECTOR

By the **Public Health Act, 1875**, *Section 189*, we have the following power for appointing sanitary inspectors, or, as they are known in England, inspectors of nuisances :—

“ Every Urban Authority shall from time to time appoint fit and proper persons to be medical officer of health, surveyor, inspector of nuisances, clerk, and treasurer ; provided that if any such authority is empowered by any other Act in force within their district to appoint any such officer, this enactment shall be deemed to be satisfied by the employment under this Act of the officer so appointed, with such additional remuneration as they think fit, and no second appointment shall be made under this Act. Every Urban Authority shall also appoint or employ such assistants, collectors, and other officers and servants as may be necessary and proper for the efficient execution of this Act, and may make regulations with respect to the duties and conduct of the officers and servants so appointed or employed.”

Similar powers with regard to the appointment of sanitary inspectors in Scotland will be found in *Section 15* of the Public Health (Scotland) Act, 1897, while with regard to London, powers are given under the Public Health (London) Act, 1891.

It will be noted in the section above quoted that the powers given are vested in Urban Authorities, and in *Section 190* of the same Act we find it stated that :—

“ Every Rural Authority shall from time to time appoint fit and proper persons to be medical officer or officers of health, and inspector or inspectors of nuisances ; they shall also appoint such assistants and other officers and servants as may be necessary and proper for the efficient execution of this Act.”

It will be seen, in comparing these two sections just quoted, that while Rural Authorities may appoint one or more inspectors, it would appear that Urban Authorities can only appoint one ; it is, moreover, important here to note that any others appointed under an Urban Authority as assistant inspectors have no statutory positions under the Public Health Acts. Hence the statutory duties of a sanitary inspector, or a medical officer of health, cannot be performed by an assistant.

By virtue of *Section 192* of the Public Health Act, 1875,

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inspectors of nuisances may also be appointed surveyor to a Local Authority, and such a dual appointment may prove advantageous to all parties in rural districts.

The duties of an inspector of nuisances, or sanitary inspector, are defined in the **General Order of the Local Government Board** of the 23rd March 1891, and are as follows :—

“ 1. He shall perform, either under the special directions of the Sanitary Authority, or (so far as authorised by the Sanitary Authority) under the directions of the medical officer of health, or, in cases where no such directions are required, without such directions, all the duties specially imposed upon an inspector of nuisances by the Public Health Act, 1875, or by any other statute or statutes, or by the Orders of the Local Government Board, so far as the same apply to his office.

“ 2. He shall attend all meetings of the Sanitary Authority when so required.

“ 3. He shall, by inspection of the district, both systematically at certain periods, and at intervals as occasion may require, keep himself informed in respect of the nuisances existing therein that require abatement.

“ 4. On receiving notice of the existence of any nuisance within the district, or of the breach of any byelaws or regulations made by the Sanitary Authority for the suppression of nuisances, he shall, as early as practicable, visit the spot, and inquire into such alleged nuisance or breach of byelaws or regulations.

“ 5. He shall report to the Sanitary Authority any obnoxious or offensive businesses, trades, or manufactories established within the district and the breach or non-observance of any byelaws or regulations made in respect of the same.

“ 6. He shall report to the Sanitary Authority any damage done to any works of water supply, or other works belonging to them, and also any case of wilful or negligent waste of water supplied by them, or any fouling by gas, filth, or otherwise, of water used for domestic purposes.

“ 7. He shall from time to time, and forthwith upon complaint, visit and inspect the shops and places kept or used for the preparation or sale of butcher's meat, poultry, fish, fruit, vegetables, corn, bread, flour, milk, or any other article to which the provisions of the Public Health Act, 1875, in this behalf shall apply, and examine any animal, carcase, meat, poultry, game, fish, flesh, fruit, vegetables, corn, bread, flour, milk, or other article as aforesaid, which may be therein ; and in case any such article appear to him to be intended for the food of man, and to be unfit for such food, he shall cause the same to be seized, and take such other proceedings as may be necessary in order to have

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the same dealt with by a Justice : provided that in any case of doubt arising under this clause, he shall report the matter to the medical officer of health, with the view of obtaining his advice thereon.

“ 8. He shall, when and as directed by the Sanitary Authority, procure and submit samples of food, drink, or drugs suspected to be adulterated, to be analysed by the analyst appointed under ‘ The Sale of Food and Drugs Acts, 1875,’ and upon receiving a certificate stating that the articles of food, drink, or drugs are adulterated, cause a complaint to be made, and take the other proceedings presented by that Act.

“ 9. He shall give immediate notice to the medical officer of health of the occurrence within the district of any contagious, infectious, or epidemic disease ; and whenever it appears to him that the intervention of such officer is necessary in consequence of the existence of any nuisance injurious to health, or of any overcrowding in a house, he shall forthwith inform the medical officer of health thereof.

“ 10. He shall, subject to the directions of the Sanitary Authority, attend to the instructions of the medical officer of health with respect to any measures which can be lawfully taken by an inspector of nuisances under the Public Health Act, 1875, or under any other statute or statutes, for preventing the spread of any contagious, infectious, or epidemic disease of a dangerous character.

“ 11. He shall enter from day to day, in a book to be provided by the Sanitary Authority, particulars of his inspections and of the action taken by him in the execution of his duties. He shall also keep a book or books, to be provided by the Sanitary Authority, so arranged as to form, as far as possible, a continuous record of the sanitary condition of each of the premises in respect of which any action has been taken under the Public Health Act, 1875, or under any other statute or statutes, and shall keep any other systematic records that the Sanitary Authority may require.

“ 12. He shall, at all reasonable times, when applied to by the medical officer of health, produce to him his books, or any of them, and render to him such information as he may be able to furnish with respect to any matter to which the duties of inspector of nuisances relate.

“ 13. He shall, if directed by the Sanitary Authority to do so, superintend and see to the due execution of all works which may be undertaken under their direction for the suppression or removal of nuisances within the district.

“ 14. He shall, if directed by the Sanitary Authority to do so, act as officer of the said Authority, as Local Authority under

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the Contagious Diseases (Animals) Act, 1886, and any orders or regulations made thereunder.

“15. In matters not specially provided for in this order, he shall observe and execute all the lawful orders and directions of the Sanitary Authority, and the orders of the Local Government Board which may be hereafter issued, applicable to his office.”

This list just quoted seems comprehensive enough, and students will do well to study it thoroughly, as it often happens that a question on the duties of an inspector is set on the examination papers.

In addition to the duties just enumerated, the inspector of nuisances may be appointed inspector under the Shops Acts, inspector under the Rats and Mice Destruction Order, 1919, inspector under certain Housing Acts, etc., but these appointments are, of course, in addition to the principal inspectorship.

N.B.—Sanitary inspectors must be qualified by a certificate granted by some recognised examining body.

It is essential that the sanitary inspector should be the possessor of a sound constitution and physique.

He should be temperate in his habits, and follow the principles which lead to continued good health.

He must be diplomatic, tactful, and courteous, and while patient, he must also be firm in any attitude he takes up.

He must be absolutely impartial, and must on no account jump to conclusions, nor must he accept any and every story told him. He must see things for himself, and thoroughly inquire into every matter before giving a decision thereon.

He should have a fair education and be able to deport himself in any company, as his duties will take him not only into the squalor of the slum, but also into the drawing-room of the West End.

It is essential that he should have a good knowledge of building construction, plumbing, water supply, and drainage.

He must cultivate sharpness of eye, a sensitive nose, and an ear quick to detect any unusual sound.

He should be at all times calm and collected in his bearing, and even while being abused, he must restrain his temper.

Added to these qualities, it is essential that he should have a thorough knowledge of all the duties of an inspector and of the provisions of all the Acts, Orders, and Regulations with which he is called upon to deal.

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Chapter XVIII

ADMINISTRATION AND ROUTINE OF A SANITARY DEPARTMENT

THE composition of the staff of a sanitary department will depend largely on the extent of the district served, and whether or not it is an urban or a rural one.

In country districts one usually finds an inspector appointed to deal with a very large area, and the most difficult part of the work is in covering the whole of the ground under his charge.

Again, in small towns and burghs, one very often finds that a dual appointment is made, the inspector of nuisances being at the same time the surveyor of the district.

In towns of larger size, and in cities, one finds quite a large staff employed, but there is, as a rule, only one sanitary inspector or inspector of nuisances as defined by law.

Under this chief inspector, as he is usually styled, there is a staff, and the members of such staff are allocated different duties in something after the following manner. Say we take an office with a staff of twenty-four members, it may be found that they are fixed up as follows :—

- 1 Chief inspector.
- 1 Supervising inspector.
- 6 District inspectors.
- 6 Assistant district inspectors.
- 3 Food inspectors.
- 2 Smoke inspectors.
- 1 Housing inspector.
- 1 Plumber inspector.
- 1 Mason inspector.
- 1 Clerk.
- 1 Junior inspector (gaining experience).

The area covered by the town or city is divided into six districts, over which a district inspector is given charge.

In this district the inspector, along with his assistant, carries out all the duties assigned him under the various Acts, with the exception of food inspection, smoke inspection, and housing inspection—these duties being attended to by the inspectors specially trained and appointed for such work.

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The plumber and mason inspectors, known in many districts as building inspectors, superintend smoke, water, and other drain tests, and supervise the work of alterations or repairs on existing drains, etc.

The various inspectors keep a record of their duties, carried out day by day, in a memorandum book, and also submit reports to the chief inspector on all matters which call for such action. The inspectors also submit a report of the whole of their work every month for the compiling, by the chief, of his report to his Sanitary Authority.

In addition to the written reports, the inspectors must keep their chief advised by verbal reports in connection with the work going on.

The clerk's duties are to type and copy all letters from the department, make out the various notices, post all registers and books, and attend to the office duties generally.

Should there be a junior inspector on the staff, he will usually be found to be a young man gaining experience either before or after passing his examination.

The chief of the department will attend to the matter of correspondence, give consultations to any requiring his advice and guidance in sanitary matters, visit and inspect all work of importance, and where it is necessary to exercise his statutory powers, periodically visit dairies, cowsheds, workshops, bake-houses, common lodging-houses, properties with which steps will have to be taken under the Housing Acts, etc., and prepare his reports to the Local Authority and the Ministry of Health.

In addition, he must see that the organisation of his department is working as efficiently as possible, and should occasion arise, he will have to deal with any member of his staff who may have given cause to be dealt with for some reason or another. The chief must also attend all meetings of the Sanitary Authority, and be prepared to enlighten the members thereof as to any points round which there is any doubt, or explain particular points in connection with reports submitted.

The supervising inspector is the right-hand man of the chief, and it is his duty to lighten the duties of his chief as far as possible by looking after the general administration of the office work, supervising the inspectors in their work, and generally ensuring that everything is properly carried out.

In addition, there will in all probability be a few ladies, such as lady health visitors, district nurses, and welfare nurses.

The duties of the lady health visitors are to visit in the poorer quarters of the towns and cities, and suggest to the householders certain things to do to improve their living conditions, and generally

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to get these people to keep their houses and persons in a cleanly state. These duties are arduous, and call for a large measure of patience, tolerance, tact, and broad-mindedness.

Welfare nurses work in connection with maternity centres and child-welfare work, and are making a big bid in their daily duties to reduce the high infantile mortality in our country.

District nurses are employed to attend to cases of minor infectious troubles which are treated at home, and here again the work is both trying and arduous.

The office hours in connection with a public health department are usually from 9 A.M. to 5 P.M.

The inspectors report for duty at 9 A.M., and are, as a rule, allowed an hour to write reports, consult with the chief or supervising inspector, receive the complaints (in connection with district work) which have been sent in, and also receive any necessary instructions from the superiors. The inspectors leave the office, say, at 10 A.M., and thereafter carry out their duties in their respective districts. A break of an hour is allowed for dinner, when they again report for duty and proceed at once to their work, finally reporting at five o'clock for "off duty."

In addition to day duty, there is also a certain amount of night work, when the inspectors report at 11.30 P.M. or midnight, and work right on till (say) 4 or 4.30 A.M.

Their duty during those hours will be that of visiting and inspecting common lodging-houses, houses let in lodgings, and property in the poorer quarters of the town, in order to prevent or detect cases of overcrowding.

Moreover, if the inspectors are also shop inspectors, they will have duties to perform during the evenings and on shop half holidays, to see that the various provisions of the Shops Acts are enforced.

From this it will be seen that, so far as working hours are concerned, the inspector has a good deal of call on his time, but it should be remembered that an inspector—once he is appointed—is liable to be called on at any time of the day or night should a case arise.

On a complaint being received of a nuisance or other matter with which the sanitary inspector has to deal, it is immediately entered in what is known as a Complaint Book, which sets forth the number of the complaint, the date when complaint is made, the name of the complainant, the nature of the complaint, the name of the inspector attending to the complaint, the date when attended to, the action taken, and the result of such action.

In addition to the Complaint Book, there is a set of registers which must be kept, as, for instance, Register of Common Lodging-

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Houses and Keepers, Register of Houses Let in Lodgings, Register of Workshops, Register of Dairy Premises and Cowsheds, Register of Milk Purveyors, Register of Workshops, Register of Scheduled Properties under the Housing Acts, Register of Factory and Workshop Inspectors' Intimations, Register of Prosecutions, Register of Shops under Shops Acts, and Register of Margarine Factories in the district.

In addition to these, journals must be kept in which are entered the notices served from the department, together with the result of such action. Then there is also a journal in which is entered the various purchases under the Food and Drugs Acts, the analyst's report, and the result of proceedings taken on such report. Another journal is used to keep a record of all smoke observations, the action taken, and the result of such action. The plumber and mason (or building) inspectors will also have a journal in which particulars of renewed and repaired work will be entered, together with any new work carried out at the instigation of the department.

Records of all visits to common lodging-houses, houses let in lodgings, and ticketed houses are entered in separate books under the respective head, together with the date on which the inspections are made.

The inspector of each district is provided with a Report Book in which he enters all reports that are to be dealt with summarily. In addition to the Report Book, each inspector has a Daily Report Book or Diary, a small Dairy and Cowshed Register (pocket size), Workshop Register, Register of Common Lodging-Houses and Houses Let in Lodgings, Shops under Shops Acts, and a Smoke Report Book in case he may have to assist the smoke inspector.

The inspectors are also supplied with measuring tapes and rules, electric flash lamps, and necessary notebooks.

All the main journals and registers are posted by the clerk and kept up to date by him, and he will also type and copy all letters going out from the department, as well as prepare all notices in readiness for the chief's perusal and signature.

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Chapter XIX

SERVICE OF NOTICES

WHEN a complaint is received by the sanitary inspector of the existence of a nuisance within his district, or any other matter calling for the exercise of his statutory powers, it shall be his duty to, as early as possible, visit and inspect the place, premises, or building complained of, and satisfy himself as to the reliability of the information.

He must not approach the matter in any prejudiced manner, nor wholly accept any statement which he may have given him. It is his duty to carefully inquire into all the various circumstances of the case, and he must be careful in noting all the various details, as these may be of value if legal proceedings are instituted.

Here let it be stated that it is not by any means necessary, nor is it always advisable, to invoke the aid of the law, or even threaten it on every possible occasion.

At the same time the inspector should not be over-tolerant in dealing with a case, as there are many who will not move until absolutely compelled to do so by the most drastic measures at command.

Under the Public Health (London) Act, 1891, Section 3, and the Public Health (Scotland) Act, 1897, Section 19, it is quite legal to send an "intimation" of the existence of a nuisance or offence under these Acts.

Unfortunately, no such legal provision is made with respect to England in the Public Health Act, 1875, but despite this omission, it will save much time, and often unpleasantness, if some sort of formal intimation is first sent to the person or persons responsible for the act or default complained of. In this way, statutory notices are only required where nothing else will serve; thus the work in this connection is reduced to a minimum.

When such a situation arises, the inspector must decide as to whether the complaint is to be dealt with under a law or a byelaw.

It will be of advantage here if we give Lumley's definition of a byelaw together with one or two of his remarks thereanent.

"A byelaw," he says, "is a law made with due legal obligation by some authority less than the Sovereign and

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Parliament, in respect of a matter specially or implicitly referred to that authority and not provided for by the general law of the land.

"A byelaw must be consistent with, and not repugnant to, the general law.

"It must provide something in addition to the general law, and therefore must not simply re-enact it.

"It must be general in its application."

Let us assume that a complaint has been received with respect to the existence of a nuisance within the district, that the sanitary inspector has visited the place, and having satisfied himself of the existence of such nuisance, has sent a written intimation to the person responsible, and that no action having been taken to remove the cause of complaint, *the inspector must of necessity report the matter to the Sanitary Authority* at the next meeting, and ask for their instructions to serve a statutory notice with the necessary powers to institute legal proceedings if the terms of the notice are not complied with in the time specified.

In filling up the notice, the description of the offence must be correct in every detail, and it is for this reason that the inspector, when visiting the place where the offence is, should be painstaking in his inspection.

The notice must be addressed to the author of the nuisance, or cause of offence, and if the complaint is one arising out of structural defects, the notice has to be served on the owner of the premises.

The time allowed for the carrying out of work as specified in a statutory notice varies from forty-eight hours upwards, according to the nature of work required to be done; but in no case should a longer period than fourteen days be allowed.

The following is the legal provision under which statutory notices are served for the abatement of nuisances, and is culled from the Public Health (London) Act, 1891, Section 4; Public Health Act, 1875, Section 94; and the Public Health (Scotland) Act, 1897, Section 20.

On the receipt of any information respecting the existence of a nuisance, the Local Authority shall, if satisfied of the existence of a nuisance, serve a notice on the person by whose act, default, or sufferance, the nuisance arises or continues, or if such person cannot be found, on the owner or occupier of the premises on which the nuisance arises, requiring him to abate the same within a time to be specified in the notice, and to execute such

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works and do such things as may be necessary for that purpose ; provided—

First. That where the nuisance arises from the want or defective construction of any structural conveniences, or where there is no occupier of the premises, notice under this section shall be served on the owner ;

Secondly. That where the person causing the nuisance cannot be found, and it is clear that the nuisance does not arise or continue by the act, default, or sufferance of the owner or occupier of the premises, the Local Authority may themselves abate the same without further order.

As a guide to the filling-in of the notice, we will take a few specifications here of how this should be done in connection with various complaints, thus :—

Drains.

Complaint : Want of proper ventilation of same.

Notice to read : The drain to be ventilated by means of heavy cast-iron pipes at least $3\frac{1}{2}$ inches in diameter, carried to a point above the roof of the house and clear of all openings to the house. The joints of such ventilation shaft to be made with molten lead and well caulked.

Complaint : Choked branch drain.

Notice to read : To cause the said branch drain to be thoroughly cleared, cleansed, and purified.

Water-closets.

Complaint : Choked water-closet.

Notice to read : Thoroughly cleanse, clear, and purify the said choked water-closet.

Complaint : Water-closet apartment out of repair.

Notice to read : Floor, walls, and ceiling to be repaired.

Sinks.

Complaint : Want of traps under sinks.

Notice to read : Provide suitable lead trap under sinks.

Soil-pipes.

Complaint : Defective existing soil-pipe.

Notice to read : To replace existing defective soil-pipe with one of heavy cast-iron at least $3\frac{1}{2}$ inches in diameter. Such soil-pipe to be carried to a point beyond all openings to the building, and the joints made with molten lead well caulked.

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Water Supply.

Complaint : Want of sufficient water supply for domestic purposes.

Notice to read : To provide a proper and sufficient supply of water for all domestic purposes.

Dust-bins.

Complaint : Broken dust-bin.

Notice to read : To repair existing dust-bin.

Complaint : Dilapidated dust-bin.

Notice to read : To replace dilapidated dust-bin with a new one of galvanised iron, of sufficient size, and fitted with close cover.

Miscellaneous.

Complaint : Leaky roof of house.

Notice to read : Overhaul, repair, and make watertight roof of house.

Complaint : Unpaved areas or courts.

Notice to read : To cause areas or courts to be paved with stone slabs, laid on a bed of good lime, the joints grouted with cement ; or the courts or areas paved with cement concrete laid with a sufficient fall towards channels leading to gully traps for carrying off surface water.

Each notice, having been properly filled in and signed by the sanitary inspector, is then served on the person to whom it is addressed.

The service of the notice must be at the known address or place of business of the person who is to receive same, or it may be sent by post to him.

Should the notice be served by one of the officials of the Local Authority, he ought to be accompanied by a witness. Both of these officials sign in a space which is usually provided at the bottom of the duplicate notice, and, in addition, they put in the date and hour of service.

Notices are usually printed in book form, and in counterfoil or duplicate or press copies, the latter being preferred in most offices, as a proper facsimile copy is thus preserved, while by their use there is considerable time and labour saved.

In the service of statutory notices it is well to be familiar with the following legal provisions, culled from the Public Health (London) Act, 1891, Sections 127 and 128 ; the Public Health (Scotland) Act, 1897, Section 159 ; and the Public Health Act, 1875, Sections 266 and 267, as applying to England.

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Notices, orders, and other such documents under this Act may be in writing or in print, or partly in writing and partly in print; and if the same require authentication by the Local Authority, the signature thereof of the clerk to the Local Authority or their surveyor or inspector of nuisances, shall be sufficient authentication.

Notices, orders, and any other documents required or authorised to be served under this Act may be served by delivering the same to or at the residence of the person to whom they are respectively addressed, or where addressed to the owner or occupier of premises by delivering the same or a true copy thereof to some person on the premises; they may also be served by post by a prepaid letter, and if served by post shall be deemed to have been served at the time when the letter containing the same would be delivered in the ordinary course of post, and in proving such service it shall be sufficient to prove that the notice, order, or other document was properly addressed and put into the post.

Any notice by this Act required to be given to the owner or occupier of any premises may be addressed by the description of the "owner" or "occupier" of the premises (naming them) in respect of which the notice is given, without further name or description.

From the foregoing, the method of service of a notice is made quite clear, and it only requires to be pointed out that the procedure with regard to byelaws as compared with laws is the same.

Should no notice be taken of the statutory notice and the work required to be done as specified therein, the sanitary inspector will lay his information regarding the complaint before the court, who are empowered to deal with it, for prosecution of the offending party or parties, and in doing so he will find his authority in Section 123 of the Public Health (London) Act, 1891; Section 259 of the Public Health Act, 1875; and for Scotland in the Public Health (Scotland) Act, 1897, Section 152, where it is laid down that—

"Any Local Authority may appear before any court, or in any legal proceeding, by their clerk, or by any officer or member authorised generally or in respect of any special proceeding by resolution of such authority, and their clerk or any officer or member so authorised shall be at liberty to institute and carry on any proceeding which the Local Authority is authorised to institute and carry on under this Act."

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The proceedings having been entered into court, it is needless to state that the inspector must state a clear, sharp case, and his witnesses be prepared to speak to whatever contravention is being dealt with.

In closing this chapter, it is well to point out that attention to detail is the most important thing in connection with the service of notices.

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Chapter XX

SUMMARY OF ACTS—ABBREVIATIONS AND DEFINITIONS—POWERS OF ENTRY

It is the intention in this chapter to give a summary of the various Acts which have been passed from time to time with respect to sanitation and public health, and to present same in such a manner as will enable the student to commit them to memory, should that be desired, with the minimum of trouble.

These are given in tabulated form as follows :—

Abbrevia- tion.	Chapter and Session.	Short Title of Act.	Date of Act.	Where Applicable.
T.I.C.	10 & 11 Vic. c. 34	Towns Improvement Clauses Act	1847	England.
P.H.A.	38 & 39 Vic. c. 35	Public Health Act	1875	England.
F.D.	38 & 39 Vic. c. 63	Sale of Food and Drugs Act	1875	Eng. and Scot.
R.P.	39 & 40 Vic. c. 75	Rivers Pollution (Prevention) Act.	1876	"
C.B.	40 & 41 Vic. c. 60	Canal Boats Act.	1877	England.
P.H.W.	41 & 42 Vic. c. 25	Public Health (Water) Act	1878	"
C.D.	41 & 42 Vic. c. 74	Contagious Diseases (Animals) Act	1878	Scot. and Eng.
			(Sec. 34)	
F.D.	42 & 43 Vic. c. 30	Sale of Food and Drugs Act	1879	"
C.B.	47 & 48 Vic. c. 75	Canal Boats Act	1884	England.
H.W.C.	48 & 49 Vic. c. 72	Housing of the Working Classes Act	1885	"
			(Sec. 7,	
			9, 10)	
C.D.	49 & 50 Vic. c. 32	Contagious Diseases (Animals) Act	1886	Eng. and Scot.
			(Sec. 9)	
M.	50 & 51 Vic. c. 29	Margarine Act	1887	"
L.G.A.	51 & 52 Vic. c. 41	Local Government Act	1888	"
H.	52 & 53 Vic. c. 11	Sale of Horsesh, etc., Regulation Act	1889	"
I.D.N.	52 & 53 Vic. c. 72	Infectious Disease (Notification) Act	1889	"
I.D.P.	53 & 54 Vic. c. 34	Infectious Disease (Prevention) Act	1890	"
P.H.A.A.	53 & 54 Vic. c. 59	Public Health Acts (Amendment) Act	1890	England.
H.W.C.	53 & 54 Vic. c. 70	Housing of the Working Classes Act	1890	Eng. and Scot.
R.P.	56 & 57 Vic. c. 31	Rivers Pollution (Prevention) Act	1893	"
L.G.A.	56 & 57 Vic. c. 73	Local Government Act	1894	England.
C.D.	57 & 58 Vic. c. 57	Contagious Diseases (Animals) Act	1894	Eng. and Scot.
C.P.	60 & 61 Vic. c. 31	Cleansing of Persons Act	1897	"
I.D.N.	62 & 63 Vic. c. 8	Infectious Disease (Notification) Extension Act	1899	England.
F.D.	62 & 63 Vic. c. 51	Sale of Food and Drugs Act	1899	Eng. and Scot.
F.	1 Edw. VII. c. 22	Factory & Workshop Act	1901	"

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In addition to these, we have the following applicable to Scotland only :—

Abbrevia- tion.	Chapter and Session.	Short Title of Act.	Date of Act.	—
P.H.(S.)A.	60 & 61 Vic. c. 38	Public Health (Scotland) Act	1897	
B.P.(S.)A.	55 & 56 Vic. c. 55	Burgh Police (Scotland) Act	1892	
B.P.(S.)A.	3 Edw. VII. c. 33	Local Government (Scotland) Act	1903	
L.G.(S.)A.	57 & 58 Vic. c. 58	Cattle-sheds in Burghs (Scotland)	1894	
C.S.B.(S.)A.	29 Vic. c. 17	Act	1866	
S.A.(S.)A.	20 & 21 Vic. c. 73	Smoke Abatements (Scotland) Act	1856	

We must also remember that various Orders have from time to time been passed, and foremost among these are :—

Abbrevia- tion.	—	Short Title of Order.	Date of Order.	—
D.C. & M.O.	..	Dairies, Cowsheds, and Milkshops Orders	1885-6, 1899	
S.M.R.	..	Sale of Milk Regulations	1901	
S.B.R.	..	Sale of Butter Regulations	1902	
G.F.	..	Glanders and Farcy Order	1894- 1907	
A.	..	Anthrax Order	1899	
F.M.R.	..	Foreign Meat Regulations Order	1908	

Students will, of course, note the abbreviations given in the first columns of the tables, as it is by these that the Acts and Orders are generally referred to.

In addition to the legal abbreviations, there are others which it is well that one should memorise, thus :—

L.A.	. Local Authority.	M.	. Magistrate.
S.A.	. Sanitary Authority.	J.	. Justice.
P.S.A.	. Port Sanitary Authority.	I.	. Intimation.
U.A.	. Urban Authority.	Not.	. Notice.
R.A.	. Rural Authority.	Nuis.	. Nuisance.
M.O.H.	. Medical Officer of Health.	S.I.	. Sanitary Inspector.
D.P.H.	. Diploma in Public Health.	I.N.	. Inspector of Nuisances.
R.M.P.	. Registered Medical Prac- titioner.	V.I.	. Veterinary Inspector.
P.S.C.	. Petty Sessional Court.	F.I.	. Food and Drug Inspector.
C.S.J.	. Court of Summary Juris- diction.	H.M.I.F.	. His Majesty's Inspector of Factories.
S.C.	. Sheriff Court.	L.H.V.	. Lady Health Visitor.
P.C.	. Police Court.	P.A.	. Public Analyst.
S.	. Sheriff.	P.F.	. Procurator-Fiscal.
S.S.	. Sheriff-Substitute.	Pros.	. Prosecutor.
		Sur.	. Surveyor.

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C.L.H.	. Common Lodging-house.	P.M.	. Privy Midden.
K.C.L.H.	. Keeper of Common Lodging-house.	P.	. Privy.
H.L.L.	. Houses Let in Lodgings.	A.P.	. Ashpit.
F.H.	. Farmed-out House.	C.P.	. Cesspool.
C.D.	. Cellar dwellings.	U.	. Urinal.
U.D.	. Underground Dwellings.	L.G.B.	. Local Government Board.
U.B.	. Underground Bakehouse.	B. of H. or	Board of Health or Ministry of Health.
I.D.R.	. Infectious Disease Report Book.	M.H.	
I.D.	. Infectious Disease.	B.A.	. Board of Agriculture and Fisheries.
Diph.	. Diphtheria.	O.T.	. Offensive Trades.
Cpox.	. Chickenpox.	H.O.	. Home Office.
T.B.	. Tuberculosis.	H.O.O.	. Home Office Order.
W.C.	. Water-closet.	Par. Coun.	. Parish Council.
E.C.	. Earth-closet.	P.L.	. Poor Law.

Though this list is fairly comprehensive, it is nevertheless one which is very easily committed to memory.

Glancing back for a little to the tables of Acts set out, it will be noted that we have dealt with all but two of these Acts at some length in treating with the various subjects to which they apply. Let us, then, take a brief survey of these two not already reviewed.

Cleansing of Persons Act, 1897.—Under this Act, Local Authorities have the power, where in their discretion they see fit, to permit any person who shall apply to them, on the ground that he is infested with vermin, to have the use, free of charge, of any apparatus (if any) which the Local Authority may possess for cleansing the person and his clothing from vermin, and the use of such apparatus shall not be considered as parochial relief, and no person shall be deprived of any right or privilege by such relief. Local Authorities may expend any reasonable sum on buildings, appliances, attendants, etc., for the carrying out of the provisions of this Act. Expenses in so doing, to be charged to any rate or fund applicable by the Local Authority for general sanitary purposes for the relief of the poor.

We will now take a brief synopsis of the **Shop Hours Act, 1892**, which makes the following provisions:—

No young person is to be employed in or about a shop for a longer period than seventy-four hours (including meal times) in any one week.

A notice must be displayed in a conspicuous place referring to the provisions of this Act, in every shop in which a young person is employed.

The definitions in the Act are:—

“*Shop*”—retail and wholesale shops, markets, stalls, and warehouses in which assistants are employed for hire, and

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includes licensed public-houses and refreshment-houses of any kind.

“ *Young person* ” is a person under the age of eighteen years.

Let us now turn our attention to byelaws, and in framing these, the following points should be noted :—

1. They should be reasonable.
2. They may be altered or repealed.
3. They must be confirmed by the Local Government Board.
4. They must be under the common seal of the Local Authority.
5. One month's notice must be given in a local newspaper of the intention to pass byelaws.
6. Ratepayers to be provided with a copy when requested.
7. When passed, they must be printed and hung up in offices of the Local Authority.

Regulations differ from byelaws in that they may simply be passed as a resolution at a meeting of the Local Authority and may afterwards be rescinded.

Byelaws for England may be made under *Section 44* of the Public Health Act, 1875, by Rural Authorities for the following :—

1. Scavenging ;
2. Removal of house refuse ;
3. Cleansing of closets, etc. ;
4. Removal of snow, ashes, dust, etc. ;
5. Keeping of animals ;

and under *Section 80* for

Common lodging-houses ;

under *Section 90* for

Houses let in lodgings ;

under *Section 141* for

Mortuaries ;

and under *Section 314* for

Hop-picking.

In addition to these, Urban Authorities may make byelaws for the following :—

Under *Section 157*, and *Section 23*, Public Health Acts (Amendment) Act, 1890, for

New streets and buildings, yard paving, closet flushing, etc. ;

under *Section 113* for

Offensive trades ;

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under *Section* 164 for

Public pleasure-grounds ;

under *Section* 167 for

Markets ;

under *Section* 169, and *Sections* 29 and 30 of the Public Health Acts (Amendment) Act, 1890, for

Slaughter-houses ;

under *Section* 9 of The Housing of the Working Classes Act, 1885, for

Tents, vans, sheds, etc.

With respect to Scotland, the following byelaws may be made under the Public Health (Scotland) Act, 1897, viz. :—

Section 32, sub-section 3, for offensive trades ;

„ 35 „ „ pigstyes ;

„ 65 „ „ public conveyances ;

„ 68 „ „ mortuaries ;

„ 72 „ „ houses let in lodgings ;

„ 73 „ „ tents, vans, sheds, etc. ;

„ 92 „ „ common lodging-houses ;

„ 180 „ „ the removal to hospital of infected persons on ships ;

„ 181 „ „ buildings, building sites, etc. ;

and under the Burgh Police (Scotland) Act, 1892—

Section 127, for cleansing ;

„ 316, „ preventing nuisances.

We now come to another important matter with respect to the law respecting sanitation, viz. definitions, with which we will take the powers of entry vested in Local Authorities and their inspectors or officers.

Taking first the Public Health Act, 1875, we find that :—

Section 4—

“ ‘ *Person* ’ includes any body of persons, whether corporate or unincorporate.

“ ‘ *Local Authority* ’ means any Urban Sanitary Authority and Rural Sanitary Authority.

“ ‘ *Lands and premises* ’ include messuages, buildings, lands, easements, and hereditaments of any tenure.

“ ‘ *Owner* ’ means the person for the time being receiving the rack rent of the lands or premises in connection with which the word is used, whether on his own account, or as agent or trustee for any other person, or who would

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so receive the same if such lands or premises were let at a rack rent.

“ ‘ *Rack Rent* ’ means rent which is not less than two-thirds of the full net annual value of the property out of which the rent arises ; and the full net annual value shall be taken to be the rent at which the property might reasonably be expected to let from year to year, free from all usual tenants’ rates and taxes and tithe commutation rent charge (if any), and deducting therefrom the probable average cost of the repairs, insurance, and other expenses (if any) necessary to maintain the same in a fit state to command such rent.

“ ‘ *Street* ’ includes any highway (not being a turnpike road), and any public bridge (not being a county bridge), and any road, lane, footway, square, court, alley, or passage, whether a thoroughfare or not.

“ ‘ *House* ’ includes schools, also factories and other buildings in which more than twenty persons are employed at one time.”

“ *Slaughter-house*,” see page 119.

“ *Drains and Sewers*,” „ 99, Vol. I.

Infectious Disease (Notification) Act, 1889.

“ *Infectious Disease*,” see page 2.

Section 16, “ ‘ *Occupier* ’ includes a person having the charge, management, or control of a building, or of the part of the building in which the patient is, and in the case of a house, the whole of which is let out in separate tenements, or in the case of a lodging-house, the whole of which is let to lodgers, the person receiving the rent payable by the tenants or lodgers either on his own account or as the agent of another person, and in the case of a ship, vessel, or boat, the master or other person in charge thereof.”

Infectious Disease (Prevention) Act, 1890.

Definition.—“ *Dairy*,” “ *Dairyman*,” “ *Medical Officer of Health*,” page 33.

Power of Entry.—*Section 5*, for cleansing any house or articles therein likely to retain infection, after twenty-four hours’ notice that such steps are to be taken.

Section 17 supplements *Section 5*.

Factory and Workshops Act, 1901.

“ *Domestic workshop*,” see page 52.

“ *Domestic factory*,” „ „

“ *Factory*,” „ „

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" <i>Workshop</i> ,"	see page 52.
" <i>Tenement factory</i> ,"	" "
" <i>Retail bakehouse</i> ,"	" 49.
" <i>Underground bakehouse</i> ,"	" "
" <i>Baking-room</i> ,"	" "
" <i>Woman</i> ,"	" 52.
" <i>Young person</i> ,"	" "
" <i>Child</i> ,"	" "

Margarine Act, 1887.

" *Butter*," see page 61.

" *Margarine*," "

Sale of Horseflesh Regulations, etc., Act, 1889.

" *Horseflesh*," see page 119.

Power of Entry.—Section 3, to sanitary inspector or medical officer of health to any building where meat suspected to be horseflesh is kept intended for human food.

" ' *Water works* ' includes streams, springs, wells, pumps, reservoirs, tanks, aqueducts, cuts, sluices, mains, pipes, culverts, engines, and all machinery, lands, buildings, and things for supplying or used for supplying water, also the stock-in-trade of any water company."

Section 37.—" ' *Earth-closet* ' includes any place for the reception and deodorisation of fæcal matter, constructed to the satisfaction of the Local Authority."

Section 74.—" *Cellar dwelling*," see page 186.

Section 89.—" *Common lodging-house*," see page 182.

Power of Entry in this Act is found as follows :—

Section 41, where written complaint is made in respect of a nuisance ;

„ 58, with respect to water meters ;

„ 102, for examining with respect to nuisances ;

„ 103, by order of Justice ;

„ 137, for carrying out orders under regulations made by the Local Government Board for prevention of epidemic disease ;

„ 116, for inspecting any animal, carcase, meat, etc.

Public Health Acts (Amendment) Act, 1890.—Section 11.

" ' *Ashpit* ' shall, for the purposes of this Act and the Public Health Acts, include any ashtub or other receptacle for the deposit of ashes, fæcal matter, or refuse.

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“ ‘ *Sanitary convenience* ’ includes urinals, water-closets, earth-closets, privies, ashpits, and any similar convenience.

“ ‘ *Street* ’ includes any court, alley, street, square, or row of houses.

“ ‘ *Dwelling-house* ’ means any inhabited building, and includes any yard, garden, outhouses, and appurtenances belonging thereto or usually enjoyed therewith, and includes the site of the dwelling-house as so defined.”

Power of Entry under this Act :—

Section 17, sub-section 2. For examining to see that chemical refuse, etc., is not allowed to be turned into sewers.

Sale of Food and Drugs Acts, 1875 and 1899.

“ *Drug*,” see page 54.

“ *Food*,” „ 65.

Housing of the Working Classes Act, 1885.

Power of Entry.—*Section 9, sub-section 3.* Power to enter by day any tent, van, shed, or structure, and examine the same.

Definition.—For the purpose of this section (9), “ day ” means the period between six o’clock in the morning and the succeeding nine o’clock in the evening.

The Public Health (Water) Act, 1878.

Power of Entry.—*Section 7.* To inspect water supplies.

Public Health (Scotland) Act, 1897.—*Section 3.*

“ ‘ *Sanitary inspector* ’ means a sanitary inspector appointed by the Local Authority under the Burgh Police (Scotland) Act, 1892, or under the Acts repealed by this Act, or under this Act.

“ ‘ *Burgh* ’ includes not only royal burghs, parliamentary burghs, burgh incorporated by Act of Parliament, but also any police burgh within the meaning of the Burgh Police (Scotland) Act, 1892.

“ ‘ *Premises* ’ includes lands, buildings, vehicles, tents, vans, structures of any kind, streams, lakes, seashores, drains, ditches or places open, covered, or enclosed, whether built on or not, under statutory authority, and every ship lying in any sea, river, harbour, or other water, *ex adverso* of any place within the limits of the Local Authority.

“ ‘ *Land* ’ shall include water and any right or servitude to or over land or water.

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- “ ‘*Ship*’ includes any sailing or steam ship, vessel, or boat not belonging to Her Majesty or any foreign Government.
- “ ‘*Street*’ includes any highway, and any public bridge, and any road, lane, footway, square, court, or passage, whether a thoroughfare or not, and whether or not there are houses in such street.”
- “ ‘*House*,’ see page 34.
- “ ‘*Factory*’ includes workshop and workplace.
- “ ‘*Ashpit*’ means any receptacle for the deposit of ashes or refuse matter.
- “ ‘*Knacker*’ means a person whose business it is to kill horse, ass, mule, or cattle, not killed for the purpose of the flesh being used as butchers’ meat.
- “ ‘*Knacker’s yard*’ means any building or place used for the purpose of a knacker’s business.”
- “ ‘*Slaughter-house*,’ see page 119.
- “ ‘*Owner*’ means the person for the time being entitled to receive, or who would, if the same were let, be entitled to receive, the rents of the premises, and includes a trustee, father, tutor, or curator, and in the case of public or municipal property, applies to the persons to whom the management thereof is entrusted.
- “ ‘*Occupier*’ means, in the case of a building, or part of a building, the person in occupation or having the charge, management, or control thereof, either on his own account or as the agent of another person, and in the case of a ship, means the master or other person in charge thereof.
- “ ‘*Author of a nuisance*’ means the person through whose act or default the nuisance is caused, exists, or is continued, whether he be the owner or occupier or both.”
- “ ‘*Common lodging-house*,’ see page 183.
- “ ‘*Keeper of a common lodging-house*,’ see page 184.
- “ ‘*Cattle*’ means bulls, cows, oxen, heifers, and calves, and includes sheep, goats, and swine.
- “ ‘*Day*’ and ‘*day-time*’ mean between nine o’clock in the morning and six o’clock in the evening.”

Powers of Entry.—

Section 18, for inspecting properties regarding nuisances ;

- „ 33, „ „ slaughter-houses and knackers’ yards.
- „ 40, „ „ dealing with houses, clothes, bedding etc.,
which require cleansing, disinfection, or
destruction ;
- „ 43, „ „ inspection of food ;

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Section 73, for inspection of tents, vans, sheds, etc.

„ 82, for dealing with infectious disease ;

„ 98, for inspecting common lodging-houses ;

„ 109, for entering lands, etc., for purpose of surveys.

Burgh Police (Scotland) Act, 1892.—*Section 4.*

“ ‘ *Building* ’ shall include any structure or erection of what kind and nature soever, and every part thereof.

“ ‘ *House*, ’ where not otherwise expressed, shall mean dwelling-house, and shall include outhouses and other erections, being pertinents of the house.”

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Chapter XXI

TYPES AND SIZES OF SANITARY FITTINGS

WE give here a short synopsis of the materials, together with their sizes, suitable to be used in a specification for sanitary work.

Drains.

Heavy cast iron, coated with protecting varnish.

Weight of pipe 90 lbs. per length of 6 feet.

Socketed, and joints made with lead and well caulked.

Glazed fireclay, socketed, joints made with Portland cement and finished smooth.

Single house drains should be of 4 inches internal diameter.

For larger drainage, pipes of greater diameter should be used, but care must be exercised in order to avoid having too large pipes.

Traps, bends, junctions, inspection eyes, etc., should be of the same diameter as the drain, and of similar material.

Soil-pipes.

Heavy cast iron, coated with protecting varnish.

Weight 38 lbs. per length of 6 feet.

Drawn lead pipes may also be used, and these should be not less than 6 lbs. of lead per square foot (8 lbs. to be preferred).

Soil-pipes ought to be at least $3\frac{1}{2}$ inches in diameter; with iron soil-pipes, the joints are to be of lead and well caulked.

Lead soil-pipe joints should be "wiped."

Waste-pipes, Sinks, and Baths.

Medium cast iron, coated with protecting varnish.

Weight 34 lbs. per length of 6 feet.

Drawn lead pipes may be used.

Pipes should be at least 3 inches in diameter.

Iron pipes should have caulked lead joints.

Lead pipes should have wiped joints.

Rain-water Rones, Gutters, etc.

Cast iron, galvanised iron, or zinc, according to pattern desired.

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Rain-water Conductors or Pipes.

Best Class Work. { Medium cast iron, coated with protecting varnish.
Weight 34 lbs. per length of 6 feet.
Joints of lead well caulked.
Cheap Work.—Zinc conductors may be used, well jointed.

Antisiphonage Pipes.

Medium cast iron, coated with protecting varnish.
Weight 24 lbs. per length of 6 feet.
Pipes to be at least 2 inches in diameter.
Joints made of lead, well caulked.
Drawn lead pipes may also be used with wiped joints.

Lead Traps for Sinks and Tubs.

Drawn lead of 2 or $2\frac{1}{2}$ inches in diameter.
Fitted with screw access plug at bottom.

Water-closets.

Glazed earthenware, with antisiphonage “ horn ” or connection.
Flushing connection and trapped outlet.
Wash-down patterns. Water seal, $1\frac{1}{2}$ to 2 inches.
Hinged rim seat.

Cisterns for Water-closets.

Galvanised iron or glazed earthenware.
Capacity 2 to 3 gallons, ball valve, syphonic action.

Flush-pipe to Water-closet.

Galvanised iron or heavy lead, screw coupling at top, $1\frac{1}{4}$ to $1\frac{1}{2}$ inches in diameter.

Service Water-pipes.

These should be of heavy lead, tested quality, and of $\frac{1}{2}$ inch internal diameter, and upwards, according to number of taps which have to be served.
Joints to be of wiped lead.

Connection between **lead soil-pipe and iron drain** should have a flanged thimble of copper, soldered on to lead pipe by means of a wiped joint. The thimble is then inserted into the socket of iron pipe, and a caulked lead joint made.

Connection between **stoneware and lead** must have a socket of brass or copper soldered on to the lead pipe by means

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of a wiped joint ; the stoneware pipe is entered into this socket and a joint made with good Portland cement.

Connection between **iron pipe and fireclay drain**. The beaded end of the iron pipe is entered into the socket of the fire-clay pipe, and the joint made with good Portland cement.

Connection between glazed **earthenware closet and iron soil-pipe** ; outlet from closet must be entered into the socket of iron soil-pipe, and the joint made with good Portland cement.

Connection between a **lead soil-pipe and fireclay drain**. A flanged thimble of copper or brass has to be soldered by means of a wiped joint to the lead pipe. This is inserted into the socket of the fireclay drain-pipe, and a joint made with good Portland cement.

STONEWARE PIPES.				CAST-IRON PIPES.			
Internal Diameter in inches.	Thickness of Pipe.	Thickness of Socket.	Depth of Socket.	Internal Diameter in inches.	Thickness of Pipe.	Thickness of Socket.	Depth of Socket.
4"	$\frac{1}{2}$ "	$\frac{1}{2}$ "	$1\frac{1}{2}$ "	4"	$\frac{3}{8}$ "	$\frac{3}{8}$ "	4"
6"	$\frac{11}{16}$ "	$\frac{11}{16}$ "	$1\frac{3}{4}$ "	6"	$\frac{7}{16}$ "	$\frac{1}{2}$ "	$4\frac{1}{4}$ "
9"	$\frac{13}{16}$ "	$\frac{13}{16}$ "	2"	9"	$\frac{17}{32}$ "	$\frac{9}{16}$ "	$4\frac{1}{2}$ "

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